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AMERICAN GAS ENGINEERING JOURNAL

FORMERLY

AMERICAN GAS LIGHT JOURNAL

VOL. CVI., NO. 20
WHOLE No. 3088

NEW YORK, SATURDAY, MAY 12, 1917

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and
WASH OIL COOLERS

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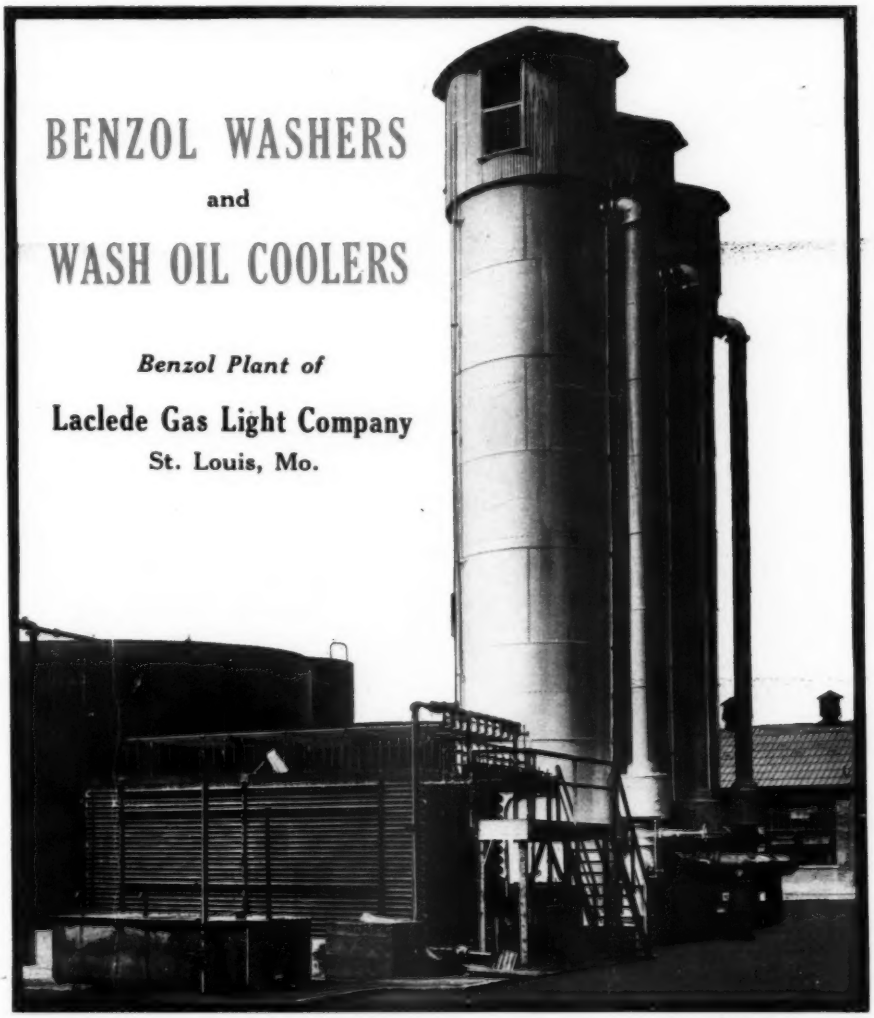

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AMERICAN
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FORMERLY THE AMERICAN GAS LIGHT JOURNAL

Vol. CVI, No. 20 NEW YORK, MAY 12, 1917 Whole No. 3088

Practice in Bracket Design for Outdoor Lighting Tending Towards One-Inch Pipe

This Size Insures More Constant Supply of Gas in All Kinds of Weather than a Smaller Size and Can Be Given Required Degree of Strength and Rigidity—Necessity of Ample Drips

By J. E. BULLARD

STANDARD TYPE SUPPLIED BY MANUFACTURER.

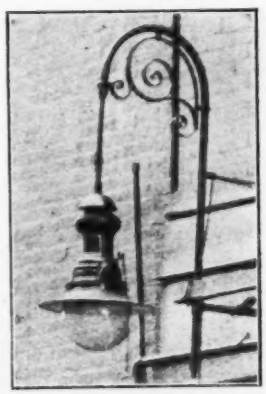
One feature of outdoor gas lighting that has a very great effect upon the consumer's attitude towards it is the method of installing. A neat attractive bracket, one that is a real ornament to the store front will tend to keep the lamps in service, whereas a bracket that is unsightly, one that, to say the least, is not an ornament to any building front will tend to cause the consumer to become dissatisfied with the lighting service.

During recent years a good deal of attention has been given to the subject of brackets. As a result it is now a rare thing to see an outdoor lamp hung on the end of a piece of rusty crooked three-eighths inch pipe. In fact the use of three-eighth-inch and half-inch pipe for outdoor gas lamp supply is now pretty well discarded. Three-quarter-inch pipe is still in quite common use. This size of pipe gives fairly good satisfaction and can be bent easily into the desired shape.

Use of Larger Pipe for Brackets

This size of pipe, however, usually requires considerable guying with wire or chain in order to give the rigidity required. If wire is used it sooner or later becomes unsightly. Chain also is rather hard to keep in good condition. In the case of three-quarter-inch pipe and chains with small enough links to harmonize with the pipe used this is even more true than in the case of larger pipe and chains with larger links.

Modern practice in bracket design is tending more and more towards the use of one-inch pipe. This is so for two reasons. First, this size of pipe insures a more constant supply of gas in all kinds of weather than is the case where smaller sizes of pipe are used. Second, it is easier to give the bracket the required degree of strength and rigidity and at the same time the graceful design desired with one-inch pipe than with any pipe of smaller size. The greater rigidity of the brackets made up from the larger pipe also means greater freedom from leaks.



ORNAMENTED WITH SCROLL WORK FOR USE OUTSIDE THEATRE

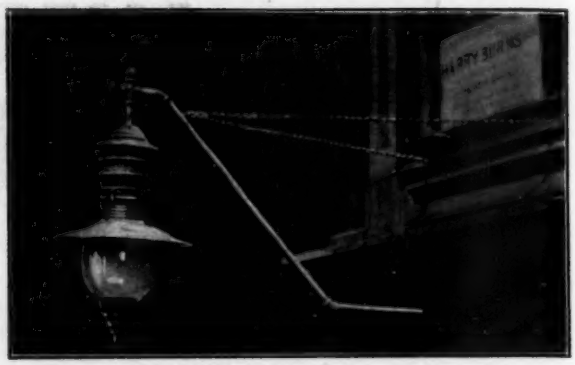
There are two general methods of making up outdoor gas brackets. Each method has its advocates and each has its advantages. In one method the bracket is composed entirely of pipe. Not only is the supply of gas carried through the pipe but also extra pipe is used for bracing the bracket to withstand wind stresses. The other method uses pipe only as a gas line and all bracing to withstand wind stresses is taken care of by guy chains. The all-pipe bracket has the advantage of being more compact, more rigid and requiring a smaller list of parts than in the case of the pipe and chain method. The pipe and chain method requires less pipe and in some cases will be lighter than an all pipe bracket. It is hardly possible, however, to make as many combinations with a pipe and chain bracket as with an all pipe bracket for the reason that pipe can be used either to brace or to guy, whereas, chain can naturally be used only for guying.

No single style of bracket can be adopted and strictly

adhered to if the gas company expects to accomplish very much with outdoor gas lighting. No particular bracket will prove suitable for all stores. Each installation is more or less of an individual problem. Some brackets must be installed so that an awning can be let down above them, some must straddle signs. Some must be guyed from window sashes above the store. Others must be braced from below. Some lamps must be hung high and some low. Some must be hung close to the window in order to give satisfactory results. Others must be hung further out over the side walk.

Necessity of Drip of Proper Size

The equipment which seems to make it easiest to meet all the conditions is one-inch pipe and fittings with ornamental caps and plugs. Whether or not a supply of chain will be required will be determined by whether it is decided to use pipe brackets or combination pipe and chain brackets. If it is desired to make the brackets especially ornamental it may be necessary to provide scroll work as well. There, however, is considerable difference of opinion in regard to whether scroll work greatly improves the appearance of the bracket. There appears to be a possibility that a bracket can be designed from pipe alone in such a way as to look more substantial and ornamental than would be the case if less pipe and more scroll work had been employed.



VIEW SHOWS METHOD OF ATTACHING CHAIN TO BRACKET

PLAIN BRACKET—SIMPLE IN DESIN YET ATTRACTIVE

In the boroughs of Manhattan and the Bronx in New York City the gas companies have adopted the practice of using pipe and chain brackets with scroll work where it is desired to make the bracket especially ornamental. In Brooklyn, however, the gas company confines itself to pipe brackets, and very rarely if ever uses any scroll work.

It takes longer to properly paint chain and scroll work than it does to paint pipe. To maintain brackets in good condition it is necessary to give them a coat of paint at least once a year. The color of this paint is largely optional, but for city service it would seem that either black or paint of the same color as the building front will give the greatest satisfaction. Preference is naturally given to black paint, since this wears longer and still results in a good appearance, than any other color, and this color is suitable for the front of any store. It also means that only one color of paint need be kept on hand.

The illustrations used in this article are photographs of actual installations and show what is actually being done.

Each bracket regardless of the style or the size of pipe used should be provided with a drip of ample size. As can be seen in the illustrations the bracket can be so designed as to make the drip harmonize with the rest of the bracket and still allow it to be of a very liberal size. Wherever it is possible to do so it is well to have the gas line slope towards this drip. Where the lamp is installed under awnings such arrangement, however, is not usually possible. In such installation the lamp bracket usually must be fairly short so that the gas line to the lamp will not be long enough to collect an unduly large amount of condensation.

Above each lamp and as close to it as possible there should be placed a drip cup to catch any condensation that passes beyond the bracket drip. If these precautions are observed in the design of the brackets outdoor gas lighting should prove perfectly satisfactory and there should be little or no trouble with the lamps due to condensation even during the coldest of winter weather.

Where the gas supply is taken from high pressure lines it is not so necessary to provide as many and as large drips for an installation of several lamps on a store front as it would be in the case of low pressure distribution.

Nevertheless, since it does not detract from the appearance of the bracket it is better practice even in high pressure districts where the gas passes through a governor just before entering the line to use one-inch pipe instead of three-quarter-inch pipe and to provide very liberal drip capacity.

War—Its Effect on the Present Price of Gas

Charles W. Hoy Offers Three Suggestions as to Means of Dealing with Existing Unprecedented Conditions—Lowering B.t.u. Requirements as an Economy Measure

This country is sending abroad vast quantities of food and materials and by so doing is making these things very scarce in home markets and is therefore forcing up prices of everything to unheard of levels, declared Charles W. Hoy, manager and engineer of the New Jersey Gas Company, of Glassboro, N. J., in a paper presented at the recent annual meeting of the New Jersey State Gas Association, at Newark. This condition has brought about tremendous building operations within the last three years in order to satisfy the war demands. New and old industries are using unusual quantities of building materials, oil, coal and labor, the effect of which is now felt keenly by the gas companies.

The demand for labor in all industries is extremely heavy and is becoming very expensive and hard to get at any price. There seems to be little hope of a change for some time after the war, for the reason that industry and production are dead in Europe and when all is over we must continue to finance our own needs as well as finance and rebuild stricken Europe.

The high cost of living has been a most persistent and most unpleasant factor in the situation. As the demand for American food and American manufactured products has increased owing to the industrial paralysis of the European nations, the price for food and other commodities in this country has advanced to unreasonable levels, until they now closely approximate the margin of prices which existed at the end of the American Civil War. Let us hope and believe that this condition of affairs is temporary, but it is none the less very real and a most disturbing element in the general situation.

How the Gas Business is Particularly Affected

Just before the European War the price of coal was more or less fairly fixed from year to year. It is true that there was a natural upward tendency in price due to the steady increase in the cost of labor and the increased demand for factories incident to general progress.

However, with the starting up of munition plants, the sudden demand of the shipbuilding industry, and the springing up of hundreds of new manufacturing enterprises, a condition was brought about in the coal industry which is without precedent and which is likely to continue for some time after the war. The demand for coal even in normal times doubles itself every four years, and it does not seem likely that the price will ever be the same as it was two years ago even if the war does not last much longer. It was possible for some companies up to the middle of last year to purchase coal at the mines for something like 90 cents a ton. They are now unable to contract for anything less than $2.50 a ton.

Most companies are buying in the open market, and most of us are forced to do this on account of the delays in delivery on contract coal. For this coal in the open market we are at the present time paying from $4.25 to $5 a ton at the mines.

Oil

The increased price of oil has shouldered a heavy burden upon the gas companies. To-day many companies are confronted with the possible necessity of having to raise the price of gas to the customer. In the manufacture of water gas, oil has become a costly medium of enrichment.

This petroleum oil, for a number of years worthless for any other purpose, was until recently, quite inexpensive. Now, on account of the enormous growth and demand for gasoline for automobiles and motor boats, processes have been invented by which these oils are turned into light oils suitable for internal combustion engines.

Oil used for these purposes by European countries, as well as our own, is naturally commanding a higher price than when used for gas enrichment.

All of the countries at war are resorting to the increased use of oil fuel for war vessels and for their needs the price is not a critical factor. This sudden demand for enriching oil products for power purposes has caused a consequent raise in the selling price so that within the last year the price of gas oil has risen from an average of 3 cents to 5½ cents per gallon, which has increased the cost of manufacturing water gas at least 15 cents per thousand cubic feet.

There is no reason to believe that the present price is a maximum. Therefore, it is easy to predict that the high price of enriching oils will make carburetted water gas a reserve to retort gas and oven gas, which will need no enrichment if a heating value in the neighborhood of 550 B.t.u. only be required. The present war price of oil results in a serious condition affecting the price of gas to the consumer.

Materials

On account of the great European demand for supplies we find that lumber has not only advanced in proportion to steel but as a result some equipment is costing to-day 150 per cent. more than two years ago. In fact, almost every article entering into the maintenance of a gas company has advanced from 50 to 200 per cent.

Purifying material has raised in price nearly 100 per cent in the last year.

Meters and governors have advanced very materially in price.

The price of some of the metals used in the gas business, such as copper, tin and lead, have advanced about 150 per cent. The price of copper alone has increased from 11½ cents to 28 cents a pound.

A large proportion of the increased cost of manufacturing water gas is represented by the oil. The second largest item being fuel expense, and in consequence of the high price of raw materials, water gas costs have gone up from 30 to 50 per cent. In carbonization plants conditions are different. Next to the great increase in the cost of coals the largest operating expense is labor on account of the large volume of coal and coke that must be handled.

Labor

The price of labor is of equally great importance. Besides the enlistment, the new and old industries mentioned, especially the munition works, have called for a large amount of unskilled labor which is secured by the simple method of offering exorbitant wages, so that some territories in which gas companies operate are nearly depleted.

This imposes a great strain on the gas industry, as we now have to accept any class of labor and do not have much choice as to age or ability.

To-day in many of our territories it is almost impossible to get laboring men and skilled mechanics, no matter what price we offer.

We are also constantly in competition for such men as are available for labor, with the building contractors and with the cities who are doing considerable work such as sewers, pavings, etc.

This results in the payment of wages far in excess of that which we paid a year ago and does not increase the amount of finished work.

We are also confronted with continuous demands of the working men for shorter hours.

One gas company, which has fifty services to be installed, as well as a few extensions of main, has two men available. Another case is that of a gas company in a larger city making an extension. The superintendent of distribution was asked how many men he had available of the thirty-six required for duty Monday morning. His reply was "One."

Quite often it occurs that men leaving work at 6 o'clock the previous evening do not show up for duty the next morning, but are found working on nearby contracts or in munition factories, for which they are receiving 50 cents more a day in addition to a bonus.

High Price Levels Must Be Met

This condition of high prices and shortage of labor gives our gas engineers a strenuous time to keep their concerns going, with any efficiency, since this labor unrest necessitates breaking in of new men with a consequent loss of efficiency and an increased cost of production.

It would be useless at this time to compute just how much this increased cost of labor affects the price of gas since the price of labor is not yet fixed and it is going up from week to week, in fact, from day to day.

It is obvious that all these high levels in prices must be met by the merchants and the manufacturer, but it is just as true with the gas company. However, we are constantly face to face with this fact that although the manufacturer and merchant can change his selling rates to fit conditions, gas rates are fixed by the public utility commission.

Another probable expense which will go far toward affecting the price of gas is the cost of maintaining guards to protect plants, distribution lines and governor stations against attacks of alien enemies. This expense will be considerable and must be reckoned with. Already a number of gas companies have a great number of men acting in this capacity.

Still another thought shows that there may be a danger of government requisition of supplies, such as gas oil, during the war which is now in progress. This would probably leave gas companies manufacturing water gas without an enricher. Government control and management might be a possibility during the war but at this time the thought is too remote to be seriously considered.

Upon consideration of the foregoing we find it to be true that the advances in the price of gas coal, gas oil, etc., have seriously raised our holder costs. Our distribution, maintenance, and other costs have also been increased enormously to the extent that it is necessary for the gas company to look about for methods of economy. As the price of gas coal has increased during the past year from 75 to 100 per cent., gas oils about 100 per cent., and labor about 50 per cent., and is very restless and inefficient, it will be necessary, if some measures are not taken to relieve them of the present high cost of production, to consider seriously the raising of the price of gas.

How Should Test Conditions Be Met

First: By a temporary increase in rate without resort to appraisal proceedings.

Second: By lowering the B.t.u. requirement.

Third: By a patriotic resolve to bear as heavy a burden as possible.

Our commissions are regulatory, and are always ready to entertain petitions regarding rate. It seems it should be only necessary for each gas company to gather together all the data pertaining to increased cost of operation and then to present same through a competent attorney to the public utility commission.

This might be in the form of an application for a temporary increase in rate and based mainly on the increased cost of operation. It is to be hoped that the required rate would be granted without the necessity of long drawn out valuation proceedings. If the petitioners are to benefit by an increase in rate they should have this rate granted in the shortest time possible. Already some companies have petitioned the several public utility commissions for an increase in rate, basing same on the increased cost of oil and coal and have been granted rate changes, which proves that the state bodies are aware of the unusual increase in cost of production and realize that the gas companies should have some temporary relief.

Saving in Oil

A reduction of the heating value standard, say from the present 600 B.t.u. to 550 B.t.u. would be an assistance to the gas companies:

First: A reduction in holder cost which would be effective both in coal and water gas plants. This point is of special importance in the case of small companies. In water gas processes a reduction from 600 B.t.u. to 550 B.t.u. it would result in reducing the oil per thousand by at least 0.5 of a gallon and perhaps somewhat more in the case of small companies. With the present abnormally high price of oil it would be an important saving.

It is possible in the operation of a coal gas plant to supply 600 B.t.u. only when using the very highest grades of gas coal. The present high prices of such coals make it very urgent that the companies be permitted to use cheaper fuels. A specification of 550 B.t.u. would enable small companies to utilize such fuels, thereby reducing their holder cost. Furthermore, it has been shown by such experts as J. C. Silverthorn and J. B. Klumpp that a considerable increase in the amount of heat of the coal is transferred to the gas when operating under low calorific value.

Second: An improvement is noticeable in all appliances using atmospheric burners and especially in mantle burners of the inverted type when 550 B.t.u. gas is used. It is a well-known fact that high heating

value is only obtained by increasing the quantity of hydro-carbon vapors which are carried in the gas.

The condensation of these hydro-carbon vapors in winter and their subsequent reabsorption in the spring results in a delivery to the consumer of a gas having a variable quantity of these vapors. The result is that all appliances are either over-adjusted or under-adjusted, according to the season of the year, and the season at which the last adjustment was made. While this condition does not seriously interfere with the operation of the domestic and industrial appliances, it is a source of constant trouble in the case of mantle burners which are bound to give considerable trouble from carbonization and subsequent breakage of mantles. A reduction in the B.t.u. from 600 to 550 B.t.u. would enable the operators to reduce the hydro-carbon vapors to such an extent that they would be delivered uniformly to the consumer at all seasons and the variation in quality due to condensation and absorption would be almost eliminated. It is the common aim of the state commission and gas companies to supply serviceable gas to the consumer at the lowest cost. The opinion is pretty general among the gas fraternity that a standard lower than 600 B.t.u. will go a great way toward counteracting the increased cost of operation.

Stripping Gas of Benzol, Toluol, Etc., Increases Naphthalene Stoppage Troubles in England

Trouble from Rust Also Experienced—Suggested Remedies for Each

By NORTON H. HUMPHRYS

With the very general practice in England of partially stripping gas of benzol, toluol, and other low boiling hydrocarbons, the old bugbear of naphthalene stoppages, which for some time had been effectively laid to rest, has been resurrected.

Under some circumstances, it is evident that the actual naphthalene content as expressed in grains per 100 cu. ft. may be of little importance, and that it is possible to reduce that quantity, and at the same time increase the liability to trouble.

Benzol and other substances of low boiling point have the property of holding that illusive substance in solution, either carrying it down in a liquid form to pass harmlessly to the nearest drip box, or retaining it in the gas until it is safely escorted through to the burner. It may happen that the gas is fairly rich in naphthalene, but that the fact is masked by the presence of sufficient low boiling hydrocarbon vapor, to prevent its deposition in the crystaline form.

If we remove say 50 per cent. of the vapors and at the same time 25 per cent. of the naphthalene, although the quantity concerned is less, the liability to trouble will be greater than before. This is exactly what has been done.

At an efficient working temperature, which should not exceed 60 deg. Fahr., the wash oil is also a moderately active absorbent of naphthalene, though if oversaturated, or used at a higher temperature, it may exercise a reverse action and add to the content.

Taking that quantity as X, and the vapor sufficient to retain it in a liquid or gaseous form as Y, at the lowest temperature and pressure to which it is likely to be exposed; so long as the quantity X is not in excess of the capabilities of Y, no trouble will result, but even an apparently trifling excess of X may lead to the gradual accumulation of pockets of naphthalene in the holder connections and mains, that may be carried forward into the services whenever the climatic conditions are congenial. Hence the troubles that are so apt to appear in the spring and autumn, the seasons of warm days and cold nights.

The gas is warmed in the holder by the rays of the sun, perhaps to a temperature of 80 deg. Fahr., and goes out into the district fairly well saturated with naphthalene at that temperature, or if not fully charged may gather more at an early stage of its career. If reduced say to 40 deg. before reaching the consumer's meter, it is obvious what will happen.

The Remedies

The remedies are a complete removal of naphthalene from the gas by the application of a suitable solvent at the works, or making up the deficiency of low boiling solvent vapor, if any, to bring Y into the correct proportion as compared with X. If paraffins or other hydrocarbons of comparatively high boiling point are used, the saturation point may be lower than Y, and the deficiency must be supplied in the form of a very finely divided spray or fog, that will carry to the extremes of the district. This is quite possible in practice.

The question assumes greater importance in view of the tendency towards a reduction of candle power, which means a drier gas. Trouble from rust has already been experienced, because the gas was previously maintained in an oily condition to an extent sufficient to hold the rust, which now has a chance to become dry and to separate in a finely divided form that is readily carried forward by the higher distribution pressures that are now in vogue, to bends, branches, or other points where it may accumulate to an extent sufficient to form an obstruction. It is necessary to draw the line between naphthalene and rust stoppages. With drier gas, an increasing preference for lead or composition pipe may be expected, unless some rustless process can be successfully adopted for wrought iron.

Describes Residential Maintenance Service at Reading

Edward A. Gicker Declares Gain in Good Will to Company Has Justified Service—Class of Man Required to Carry Out the Work

Working the city in sectional blocks, we apply for admittance, enter the premises, clean, adjust and repair all burners (open flame and incandescent), charging for supplies only, making a record of all work done, selling as many lights as possible, and incidentally learn if the consumer is a prospect for any gas appliances, or work of any nature pertaining to gas service, states Edward A. Gicker, supervisor of the residential maintenance force of the Reading, Pa., company, discussing his company's maintenance service in *New Business*. These prospects are handed to our New Business Department for attention, and a large number of good sales result from these leads.

Believing that one satisfied consumer is worth a dozen newspaper ads, it has been our aim to leave a satisfied consumer in every home visited. We make

suggestions and recommendations for better lighting service, thereby selling many lamps.

Difficulty in Getting Admittance

For a time we experienced considerable difficulty in securing admissions. This was principally due to the consumer's lack of knowledge of our purpose, even though we had advertised our plan. By polite application and careful, painstaking efforts to do our work right, we overcame these objections, and this difficulty ceased. Those for whom we cleaned lights spoke well of us to their neighbors and friends. At every "can't get in" we left a post-card explaining the object of our visit. The news of our good work spread, and these cards began to come in at the rate of about fifteen per week. We sent one man (a new man each day) back on these calls, and the amazing part of it is that about 85 per cent. of these "can't get in's" needed mantles and glassware, and about 60 per cent. bought new lamps.

We find that the greatest cause for complaint comes from lamps that are continually carbonizing. The consumer buys a mantle, places it on an inverted lamp, applies a match, turns on the gas, and not knowing differently, thinks it is ready for service. After burning a while, it starts carbonizing around the burner tip; as the burning hours increase, the carbon, caused by an improper mixture, collects on the mantle, and turns it black and Mr. Consumer waxes wroth. In many cases we find that the lamp is one of the cheap, inferior kind.

Condensation on Fixture Key

Unfortunately for our company, Mr. Consumer concludes that since the mantle is new, the gas is poor, and not placing the blame where it is due, proves a bad advertisement for the company.

Some time in the past I think some one must have gone to some five-and-ten-cent store, bought a ten-cent burner, a ten-cent globe, and a ten-cent mantle, installed them in his home, then after a few days' use coined the expression, "It Looks Like Thirty Cents."

We find many consumers who have cracked or partly broken mantles. They think, "Oh, well, it will last a while yet," and keep on burning the light until some day these small breaks destroy a chimney or rather expensive outside globe. As usual the gas company gets all the blame. Quite frequently we inspect lamps that show a poor gas flow; examination often shows condensation in the fixture key or the ell burner cock. This we remove with a piece of wire.

Some Reasons for Installation of Electric Lighting

These conditions are strong points in our competitor's favor; the remedy is the residential burner maintenance crew.

For illustration, Mr. Consumer may have combination fixtures. He uses gas for lighting. Say he has several inverted incandescent lamps; he may unknowingly get an improper adjustment on one of these burners, and it starts carbonizing. The slight explosive effect caused when ignition of the gas takes place may blow some of this carbon through the little airholes in the cylinder; it lands on an expensive table cover or doily and soils it. The housewife is highly indignant, perhaps disgusted. Along comes some "electric" salesman and writes a contract for the competitive meter, and out goes the gas meter.

While electricity does not compare favorably for lighting in cost and efficiency, yet Mr. Consumer can buy one of the later type bulbs, screw it into the socket provided for it, and get an equally bright light, until it deteriorates, with no adjustment necessary, no dirt, always ready for service "so long as the plant keeps running," and it is very convenient.

I have a case in mind where we entered a small confectionery store, doing a good business and using several $1.00 inverted lamps. The proprietor said no examination was necessary, he was sick of gas lighting, and was about ready to wire the place.

He finally consented to an inspection and we found it impossible to get a proper adjustment on his lamps. To save the loss of a customer we installed a C.E-Z lamp, as he would not listen to the cost of No. 2076 or No. 647 lights, agreeing to take down the C.E-Z light after showing him what it would do.

He was won over at once and ordered one placed on another fixture. I called next day and he expressed himself as surprised and greatly pleased to receive such attention from the gas company, saying he would have several of these lights placed in his home in the near future.

We hear many favorable comments on this work and feel that our company has made a big start in the right direction, to gain the further goodwill of the public.

Type of Man Required for Work

To follow out this work successfully requires men of more than ordinary requirements. The residential burner maintenance man should present a good appearance, keep himself neat, be of good address, courteous, tactful, patient, clearly understand the regulation and adjustment of all lamps, be a salesman, and continuously strive to advance the interests of his company. He can do this only by being a gentleman at all times, on or off duty. I say off duty as well as on, as his position brings him before many people and should he make the slightest misstep in his conduct, he will do his company irreparable harm. The public forgets the man but censures the company.

There are always positions open for this kind of men and they eventually land higher up.

We ask our fellow workmen, in every branch of the service, to speak well for us to our consumers; cooperate with us. It is for our own cause, as well as our company's we are working; we must work together to assure our own future and better our conditions in life.

Some Results Obtained

For the first three months' operation, ending Dec. 31, 1916, we made 8,468 calls, with the average admissions secured amounting to 57.4 per cent. of the total. The percentage of admissions secured has been increasing each month, as at the start of the work we only gained admission to 50 per cent. of the houses called on. In January this figure has increased to 82 per cent., denoting not only more efficient work but the growing popularity of the plan with the public.

It is our opinion that the sales have been very good and that we will be able to increase them materially as the work progresses.

Necessity of Coal Economy and Labor Shortage May Make House Heating by Gas General in Paris

After Winter of Discontent Authorities Decide to Give the Gas Companies Free Rein if They Can Get Transportation Facilities for their Needed Coal Supply—Gas Heating vs. Coal the Problem for Next Season

By FRANCIS MILTOUN

We always knew it in America—the French apparently did not—that you can get a greater economic result from a ton of coal when manufactured into gas than if burned in a stove or furnace.

France has just adopted again the "hour of summer," which means that clocks have been set forward sixty minutes. Under such a regime there is of course an economy in gas consumption. Where this has been tried before, and it was in operation last year in most of the warring nations of Europe, there has been an avowed reduction in the consumption of illuminant (in Paris estimated at 15 per cent. on the coal consumed by the gas companies for the same months in normal times) the one dissenting voice being from Germany, where Herr Lempelius, the director of the Berlin Gas Works, claims the beneficial results as nil.

Actually in Paris, at the moment, the anticipated reduction in gas consumption is figured as of 15 per cent. in April, September and October, 25 per cent for May and August, and 40 per cent. for June and July. This is far in excess of the average arrived at last year, but then the "summer hour" did not go into effect until some ten weeks later. How it will actually work out depends upon many things.

Gas Companies Resigned to Conditions

The gas companies themselves do not complain at the situation. For the lack of coal it has been all they could do in many cases to deliver the goods.

Ordinarily this "summer hour" regime might be supposed to increase the supply of gas available for other domestic uses, heating and cooking. Heat we shall not need in a few weeks, but cooking goes on forever, and we are threatened of being further rationed as to that.

I wrote in a recent article how the rationing of gas to the consumer affected both the producer and the subscriber. Even with the passing of the long winter evenings and frigid weather in Paris things are decidedly not improving, no more for the individual than for the 700 gas companies in 400 communes using five million tons of coal per annum throughout France. And the reason is: Act of God: *Force Majeur:* Act of War by the Enemies of the Republic; whatever you choose to call it.

It is a real, very real and embarrassing situation, and to help out the City of Paris has allowed the Société du Gaz de Paris to borrow 42 million francs to tide over the deficits and enable the company to pay dividends to its stockholders and meet other extraordinary expenses which have not been of its own making.

Just as the furnace and radiator manufacturers begin to nationally advertise their products in the spring in preparation for the winter to come, so the French gas companies are planning their next winter's campaign.

A campaign is not undertaken without ammunition, and the ammunition in this case is gas coal. The newly founded and installed Ministry of Transport, which concerns itself not only with the transportation of war material but all material for civilian use as well, is handling the coal situation for the gas companies, and promises to do its best, whatever that may mean; put into words six or eight months before results will be achieved.

The French coal mining regions are still for the most part, so far as those provisioning Paris are concerned, unliberated from the enemy occupation, and England's promised coal shipments have been considerably curtailed in the last sixty days owing to submarine activities—25 per cent. it is estimated. The situation at present, and prospectively, is the most embarrassing which has occurred since the war began.

Other Sources of Illumination Lacking

Calcium carbide is virtually all requisitioned for the needs of national defence, kerosene is an overseas product, the delivery of which becomes more and more difficult, and of which there is a lamentable shortage, and there are not enough tallow dips to fill the small demands which now exist. Candles, it must be remembered, in even gas and electrically lighted French cities and towns, are still largely used for convenience where we would have an extra gas burner or another bulb.

The situation has just been put to a solution by Monsieur Gustave Belot, a very considerable authority. It makes the argument favorable to the gas companies, but that after all is the only solution of the problem which will work out in the long run; make it possible for the companies to produce it, and they will produce it in his text which resumes itself as follows:

"It is entirely against the general interest to suppress, or reduce, gas consumption in an effort to economize coal. If coal was economized this past winter by the Parisian population it would have been a far more rational solution of the whole question of coal supply and its transport.

"The direct consumption of coal for heating purposes gives remarkably inefficient results; that of gas a notably and economical return.

"The transport and delivery of coal to the domestic consumer is a costly and laborious operation (indeed it is for the Paris liver. If you are on the fifth floor it costs you ten cents a sack of 50 kilos to have it delivered F.M.), more so than ever in time of war. Gas once installed (700,000 subscribers in Paris out of 3½ million population) costs nothing for delivery.

"Coal leaves a particularly inconvenient and deplorable refuse behind, demanding still more labor to remove it. All valuable by-products of coal are lost in domestic consumption, and most stoves are woefully inadequate and inefficient for the work they are called upon to perform in the damp, chill winters of the Basin of Paris (these are Fench stoves, it should be recognized, which have not even a ghost of the efficiency of the American stove). Various of these by-products are so absolutely necessary to the national defence in the manufacture of explosives that coal is bound to be distilled to produce them whether gas is produced or not, which latter, in this case, would become the by-product.

"The lesson of these last three winters of war which we have learned, if we have learned it at all, is to economize on our domestic coal consumption."

The argument of Monsieur Belot appears sound and once the formula is accepted as valid neither the gas producer nor the consumer will complain.

We have only the figures of last winter up to January to go on, but the five last months, up to January, 1917, showed a gas consumption of the Paris population of 8 million cubic meters in excess of that of the year before, which showed a deficit of 13 millions. This shows after all (since the consumption got back to within 5 million cubic meters of normal) that the rationing of gas for domestic use did not by any means do what was expected of the regime, and this in spite of a decree that closed all shops at 6 p. m. and all restaurants at 9.30.

Obligations of Commercial Department Extend Beyond Mere Selling of Gas and Insuring Good Service

H. E. Danner Asserts that the Gas Company is Measured by the Public According to its Commercial Activities—Bringing the Annual Average Gas Range Sales up from 300 or 400 to 2206

The gas company is measured by the public according to its commercial activities, declared H. E. Danner, commercial manager of the Houston Gas & Fuel Company of Houston, Texas, in his paper at the annual meeting of the Southwestern Electrical & Gas Association held recently at Dallas. The commercial department is trusted with the responsibility of making the company's reputation and too much cannot be said as to the effect that an efficient and well organized commercial department has upon the relations between the company and the consumers.

The commercial manager and the various representatives of the commercial department must at all times be diligent, obliging, affable and patient in their dealings with the general public.

The Conduct of Commercial Employees

Upon the conduct of these employees and their attitude towards the public depends to a large extent the success obtainable by any company. They must be clean-cut, tactful men and women, who in their respective spheres are interested in the civic and social work of the community, and who are looking out for the interest of the company at all times, whenever an opportunity presents itself.

It certainly is the duty of every commercial manager to belong to and become interested in all work carried on by the commercial organization of the city in which the company is operating. In most cities there are usually several organizations for promoting the general commercial and civic welfare of the community, and it is very important for him to keep in close touch with such organization work without in the least neglecting his own business duties.

The commercial end of the gas business embraces and interests every department, and it should, therefore, be of personal interest to every employee of the company regardless of his or her position, for the simple fact that it means to most every one of us our greatest opportunity for future development.

A gas company is in reality one large department working under separate divisions; manufacturing, distribution and commercial, and we must, therefore, acknowledge that each department is necessary to the other.

Some Pertinent Queries

The commercial department is considered most generally as the agency for securing the greatest volume of new business possible and deriving reasonable profits from the business secured. It is necessary then that we give special consideration to some of the things that have a decided effect upon the final results.

Is our office suitably located?

Do we have attractive window displays?

Do we have a neatly arranged salesroom?

Do we sell efficient and modern appliances that are rightly adapted to our local conditions?

Do we sell our customer more than he needs?

Do we extend credit to people we know are not worthy of credit?

Do we secure the necessary information with meter applications?

Do we follow up complaints, and see that they are given proper attention?

Do the floor salesmen give the same courteous attention to a consumer with a complaint as to a prospective customer?

Do the complaint men make temporary adjustments, or do they see to it that the complaints are permanently adjusted to the satisfaction of the consumer, thereby retaining their good will?

Do the men who install the appliances try to be clean, polite and obliging in their work?

Do the maintenance men realize how necessary it is that they do their work properly; that their work is seen by hundreds of people, and according to their work gas lighting is judged by the public?

Do the bookkeepers see that the bills get into the hands of the collectors on time?

Do the collectors realize that the longer an account remains open the less chance they have to collect?

Do the heads of departments remember that they were once in the ranks and that encouragement and kindness helps a man who is trying for advancement?

Do the employees of other departments remember how closely allied they are with the commercial department, and that they have many opportunities for boosting gas for its various applications in every household?

This brief outline serves to illustrate how essential it is to practice the most necessary things in business to-day—service and courtesy which are the basis of all successful business. Service and courtesy go hand in hand with the product of the gas company. They are as much commodities as the gas we sell, and while not included on the monthly bill some portion of each bill includes these unwritten items.

In a conspicuous location in every department of one

of the large Southern utilities may be seen the following:

COURTESY

Courtesy is a business asset, a gain and never a loss.
Officers and employees, above all others, should be courteous.
Use courtesy in all dealings with passengers, patrons and one another.

Railroad men help their company by being courteous.
This railroad believes in courtesy.
Even the discourteous like to be shown courtesy.
Smooth away life's difficulties by being courteous.
You will find your value increased by being courteous.
"Life is not too short but there is always time for courtesy."—EMERSON.

Some gas companies have adopted slogans that can be very effectively used, such as the one used by the commercial department of the Houston Gas & Fuel Company, "Always at your service." This slogan is used on all the company's advertising, including billboards, business cards, gas bills and wherever it can be properly adapted.

ADVERTISING

It is doubtful in my mind if there is a saying more popular or familiar to all the universe than "Cook with Gas." The phrase alone is proof to us that a limited amount of newspaper advertising is of the utmost importance from the standpoint of public policy. The news companies as a rule are among your largest patrons, and aside from the question of reciprocity which should be considered, the factor of your being in close touch with the representatives of the press enables you, when you need help, to at least have the statements outlining your public policies printed in such a manner that the intent will not be garbled and a wrong interpretation be placed on the whole matter.

When the uses of gas are considered from a standpoint of utility, economy and convenience, it will be readily understood why all modern households, shops and factories have adopted its use in preference to other fuels. The use of gas may be divided into five compartments, viz,: Cooking, heating, lighting, water heating and industrial.

Standing out above all else as the greatest labor saving invention for the genuine benefit of womankind is that wonderful achievement of science, which has made the refinement of cooking possible—the modern gas range. Before the organization of a commercial department in Houston the annual gas range sales averaged from 300 to 400, which contrasted with our average sales of 2,206 for each of the past three years plainly demonstrates what can be achieved through commercial activity.

The heating business in the South is of such a character that it has become a question of serious consideration with artificial gas companies. While the heating season varies from possibly two or four months during the year, and the use of gas for this purpose is intermittent, it is necessary to provide additional plant and distribution equipment as a matter of preparedness to meet this demand, which additonal investment is not a revenue producer during the remainder of the year.

WATER HEATING, LIGHTING AND INDUSTRIAL

This class of business collectively should demand the closest attention and be specialized on by the commercial department, for here we have an opportunity of building up our output and increasing our income on the otherwise idle plant and distribution investment made necessary by the demands during the heating season. Concentration of effort, in my opinion, is the best way to obtain this business.

For example, during the past year we specialized for two weeks on one occasion on water heater sales, during which time we sold 136 water heaters, deriving a net profit of $380.99 from the sale of the heaters, and estimating the average use of each heater for one hour every day will represent an annual consumption of 2,382,000 cu. ft.

During a recent campaign on outdoor lighting we secured one installation of twenty-five mantle multiflex arcs, which extend from one street to another, through an entire block occupied by two business firms. The gas consumed through this installation will approximate 400,000 cu. ft. annually.

Make any deductions you wish from these figures, you will still realize that this is the most profitable kind of business to secure, inasmuch, as your initial investment in plant and distribution is not increased.

The industrial business, however, should receive the greatest attention, as in many instances one industrial installation is equal to as many as from one hundred to one hundred and fifty ordinary residence consumers. The ordinary residence consumer requires just as much attention as a big one, and it, therefore, behooves us to keep constantly angling for the "big fish."

One of the most recent large industrial consumers secured by us was the Cheek-Neal Coffee Company. For this consumer we installed four monitor coffee roasters of two bag capacity which will approximate an annual consumption of 6,000,000 cu. ft.

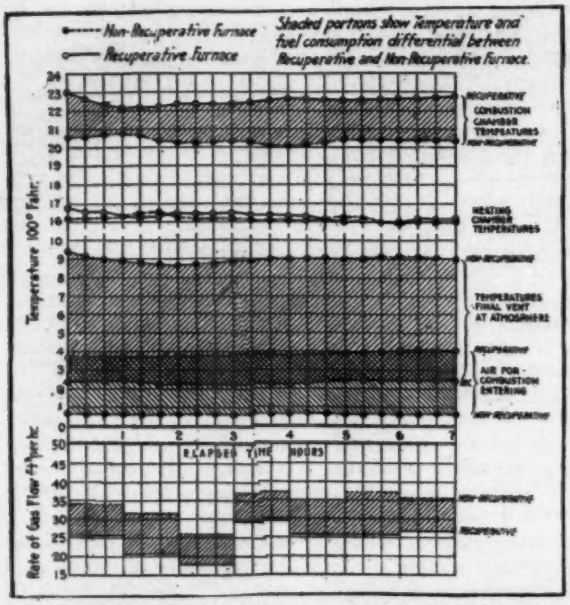
Accurate Temperature Requirements Prohibit Use of Regenerative Furnace in Certain Heat Treating Operations

W. C. Buell, Jr., Describes Tests which Show 7,580 Saving in B.t.u. Requirement Using Regenerative Furnace

For many years the regenerative furnace has been used on apparatus requiring high heat such as open-hearth furnaces, soaking pits, glass furnaces and similar apparatus, the application in the foregoing instances generally being made with the object of increasing flame temperature to produce the high heat necessary, states W. C. Buell, Jr., in an article in a recent issue of the *Iron Age*. While the increase in flame temperature has been the item of greatest importance, a great fuel saving has followed by the return of heat, which is normally wasted through the stack to the furnace, with the air required for combustion.

PRINCIPLE CANNOT BE APPLIED WHERE CLOSE TEMPERATURE LIMITS ARE IMPERATIVE

The regenerative principle cannot be applied to those operations where close temperature limits are imperative, as the temperature of the heating chamber and the work in the regenerative furnace is highest just after the furnace is reversed. This temperature frequently runs down 100 or perhaps 200 deg. Fahr. before the furnace is again reversed and the newly heated checkerwork gives up its heat to the air to produce the maximum temperature. Therefore a pyrometer chart of the


Non-Recuperative Furnace
Recuperative Furnace
Shaded portions show Temperature and fuel consumption differential between Recuperative and Non-Recuperative Furnace.
Temperature 100° Fahr.
Rate of Gas Flow 4th per hr.
RECUPERATIVE COMBUSTION CHAMBER TEMPERATURES
NON-RECUPERATIVE
HEATING CHAMBER TEMPERATURES
TEMPERATURES FINAL VENT AT ATMOSPHERE
AIR FOR COMBUSTION ENTERING
ELAPSED TIME HOURS

COMPARISON OF TEMPERATURES OF COMBUSTION AND HEATING CHAMBERS

heating chamber of regenerative furnaces reminds one of the edge of a saw, each sawtooth in this case representing a reversal of the furnace.

In these days of alloy and high-carbon steels that must be heated within very close limits to produce well-defined physical changes in the metal, a 100-deg. variation in temperature is frequently sufficient to give the steel an entirely different structure than that desired, and the development of steels of this class has undoubtedly been responsible for the great advance in the last two or three years in the even heating properties of the heat-treating furnace. These accurate temperature requirements absolutely prohibit the use of the regenerative furnace in heat-treating operations. The economy of the existing types of heat-treating furnaces has been greatly improved, but the scarcity of natural gas and liquid fuels, has caused a continued rise in fuel prices and the result is that the fuel bill of the manufacturer is greater, in spite of many economies, than it ever has been before.

Stack Loss

In any furnace operation the great majority of the fuel is used to satisfy the thermal requirements of the furnace and the vent or stack loss. A proper design and the use of insulating material undoubtedly tends greatly to reduce the furnace loss proper, but insulation has no effect on the vent loss unless perhaps it increases it somewhat.

Of all the fuel used in a furnace, seldom less than 25 per cent. is lost through the vent, and frequently this loss runs up to 50 and even 60 per cent. Therefore, the possible economy to be secured by the utilization of the waste heat at this point is great, and in addition to the actual fuel returned in the air as heat, a still further saving in fuel is secured by the increase in the flame temperature of the fuel. This is really a most important point as practically all of the commercial gaseous fuels that are delivered to the furnace cold are deficient in flame temperature.

The chart reproduced is typical of test runs with a Tate-Jones recuperative oven furnace and a non-recuperative one of the same size. The abstracted balance sheet from these test runs is presented, figures covering an average hour of operation after the furnaces had reached equilibrium at 1,600 deg. Fahr.

Equilibrium in furnace practice designates the furnace condition after the refractories have absorbed the heat required to satisfy their thermal requirements. It is only then that the heat to satisfy the radiation loss flows freely through the walls, none of it being necessary to heat the refractories as is the case until equilibrium is reached.

When equilibrium is reached, if the temperature in the heating chamber remains the same, the temperature at any point in the brickwork and the temperature of the outside of the furnace will remain the same. Therefore readings and temperature balances taken after this point has been reached show the actual radiation and vent losses from the furnace, as none of the heat entering the furnace in the fuel is being absorbed by the furnace itself.

B.t.u. Saving

In these tests no material was handled in the heating chamber of the furnaces and therefore the operative efficiency of the furnaces is not figured. The gas consumption of the furnaces per hour represents the actual amount of heat it will require to maintain them at 1,600 deg. and therefore the actual furnace losses.

From this balance sheet it can be seen that 28,920 B.t.u. were required to maintain this furnace at that temperature with the recuperator attachment, and 36,400 B.t.u. were required when no recuperator was used. This shows that but 80 per cent. of the fuel necessary to operate the furnace without the recuperator was required by the furnace with the recuperator. It will also be noted that there was returned in the air only 1,712 B.t.u., which represents a fraction less than 6 per cent. of the total B.t.u. used. In spite of the fact that only this 6 per cent in the air was returned, a net saving in fuel was secured of approximately 20 per cent. The additional 14 per cent. saving is secured by the increase in flame temperature.

Extent Flame Temperature Operates Towards Economy

A comparison of the balance figures in the table shows to what an extent the flame temperature operates towards economy. As an example, with the higher combustion chamber temperature of the recuperative furnace, a total of only 17,122 B.t.u. were used to satisfy combustion chamber losses, while 19,200 B.t.u. were required in the furnace without the recuperator, and with a combustion chamber temperature approximately 150 deg. Fahr. lower in the furnace without the recuperator. These same comparisons follow throughout the table.

The final vent loss shows that 3,700 B.t.u. were lost into the atmosphere from the recuperative furnace whereas 10,250 B.t.u. were lost from the furnace without the recuperator. The chart shows the increase in the combustion chamber temperature due to the increase in the flame temperature. The saving in temperature at the vent in each instance and the increase in the temperature of the air from recuperation are also shown on the chart. A comparison of the heating chamber temperatures is given in the chart, and a comparison of the gas consumptions is also given.

BALANCE SHEET FROM TYPICAL TEST

	Gas Oven Furnace.	Recuperative Gas Oven Furnace.
Total in fuel	36,400	28,920
Returned in heated air	0	1,712
Total to furnace	36,400	30,632
Radiation loss:		
Combustion chamber	19,200	17,122
Heating chamber	6,950	6,060
To recuperator	0	7,450
Vent loss	10,250	0
Total	36,400	30,632
To recuperator		7,450
Returned in heated air		1,712
Radiation loss:		
Recuperator		2,038
Vent loss		3,700
		7,450

LOW TEMPERATURE OF GASES LEAVING VENT

An interesting feature is often observed at the outlet of the recuperator. It will be noted that the temperature of the flue gases leaving the recuperative furnace show a temperature of 240 deg. Fahr. When operating this furnace at lower heating chamber temperatures or when the recuperator is attached to smaller units, the flue gas leaves the final vent with the water vapor showing as steam. This shows the low temperature of the gases leaving the vent.

A feature of the recuperative furnace is the improvement in working conditions surrounding the furnace. This will be perfectly apparent if the final vent loss as shown in the table is considered. This shows that at the final outlet of the furnace with the recuperator, 3,700 B.t.u. per hr. pass into the atmosphere while in the furnace without the recuperator 10,250 B.t.u. pass into the atmosphere. This particular feature will be found of great value where furnaces of this type are used, as they frequently are, in rooms where a considerable number of men are working.

The above figures and chart are interesting as an example of what can be done toward increasing the efficiency of small furnaces by proper recuperation, which not only leads to a saving in fuel but also results in better operating conditions in and around the furnace. It has been proved by tests which the writer conducted that by recuperators and furnaces of proper design, the above outlined principle can be satisfactorily applied to larger furnaces of the heat-treating and forging type and fuel savings as high as 50 per cent. can in some cases be secured.

Better to Underestimate Performance of Appliance Than to Overestimate

An appliance sold to a responsible customer, better performing its functions, as to operation and cost, than stated by a salesman, is an appliance well sold and but the fore-runner of others, and a booster for the company; but an appliance sold on misrepresentation, knowingly or otherwise, is like driving a nail into your own coffin, and if done often enough will but end in a funeral.—*F. L. Marshall at Southern Gas Association Convention.*

London Sliding Scale a Source of Weakness to Gas Companies in Present Crisis

Laws of Supply and Demand Beyond the Control of Acts of Parliament — Situation Must Be Speedily Remedied or Gas Company Investment Will Be Seriously Endangered

By NORTON H. HUMPHRYS

The present position of financial affairs generally in connection with English gas underakings, and especially the issue of new capital, the renewal of dividends terminable debentures, and the payment of dividends, is such as to cause serious anxiety.

It is drifting towards a hopeless state of muddle that, if not energetically checked, will not only inflict serious and in some cases ruinous loss on existing stockholders, but greatly prejudice the future extension of business by rendering it impossible to place new capital on reasonable terms.

There is a tendency amongst outsiders to overlook the effect of the auction clauses under which the larger portion of the existing capital has been raised. The importance of these clauses, from the consumers' point of view, is evident by a glance at the proportion of non-dividend bearing premium capital that figures on every statement of account. In fact, the greater part of the property that is now in danger was bought by the present holders at prices considerably in advance of face value, and the nominal rate of dividend represents a proportionate increase on the actual rate received on the cash investment.

The case of companies subject to a standard rate of dividend, is not acute, so long as the allowable maximum price of gas is sufficient to admit of earning the full dividend. But where the sliding scale is in use, and this applies to the more important undertakings, many are not receiving as much as 3 per cent. on their investment, after payment of income tax.

Terminable debentures are falling due, and under existing regulations cannot be renewed at less than face value, or bearing more than 5 per cent. of interest, and it is impossible to raise a sixpence on any such terms as that.

The so-called Parliamentary protection, for which high prices have been indirectly obtained from the statutory companies in the form of obligations and restrictions, is worse than useless under present conditions, which illustrate the fact that the laws of supply and demand, both as regards money and material, and market buying or selling terms, are beyond the control of Acts of Parliament.

Unless some energetic action is taken, the future expansion of the industry will be hopelessly prejudiced by the discredit of gas investments amongst capitalists, who will divert their spare cash towards less restricted and more profitable sources of investment which can be found.

The consumers of gas are equally interested with the shareholders in the maintenance of the value of gas stocks, and the subject should be dealt with, not so much as a project for the relief of the numerous small investors who are practically robbed of the nether millstone by the shrinkage in the market value of their securities, which is merely a matter of common honesty, but as a public question affecting the supply of one of the most important necessities of modern conditions of industrial and domestic society.

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Naphthalene and Rust Stoppage Troubles Arising from Stripping Gas of Lighter Oils

With the possibility of stripping our gas of its lighter oils—benzol, tuluols, etc. to meet the needs of the Nation—ahead of us, the American gas man would do well to read the short article by Norton H. Humphrys dealing with English experiences, which is published elsewhere in this issue. There are hints contained in it that are worthy of consideration.

Possible General Replacement of Coal by Gas for Heating in Paris

An exceedingly interesting possibility is indicated by Mr. Miltoun's article on the Paris gas situation, which appears elsewhere in this issue. The coal supply problem has become very acute there. Officials are getting down to fine points in the matter of conservation.

Gas must be manufactured, even aside from the needs of the civil population, if only for its by-products which are so essential for munitions. The question of labor has an enhanced importance. The matter of whether a sack of coal must be carried up stairs or not in normal or pre-war times was hardly worth bothering about. To-day France's man power and woman power must be mobilized to the limit for a more worthy task.

It seems possible that gas will be used in the place of raw fuel to heat the Parisians' homes next winter. Thus war will have brought that part of the French nation to a point it might not have otherwise reached in a century.

Though the measure will be intended as temporary it is highly unlikely that it will not turn out to a great degree to be permanent. The present generation has given more thought to its obligations to future generations than has any generation in the past.

When we build roads we no longer issue bonds that will be payable twenty-five years after those roads are not even a memory, to defray the cost as was done in the past. When our President indicated that the present war is to be largely a " pay as you go " war the proposition received unanimous commendation.

Under no circumstances is it likely that our coal resources will give out in a sufficiently short space to inconvenience or endanger ourselves, our children, our grandchildren or our great-grandchildren. It is an even chance that our own blood may be completely extinct before such a calamity could befall.

Yet this generation has worried considerably over the waste of our coal resources, has taken great strides towards eliminating it and getting from each ton every valuable product that it contains.

With their coal-burning heaters replaced by gas equipment, it will be but a step for the French, idealists by their very nature, to take into consideration the far-sighted view. The convenience of gas for heating will be an additional factor. It is not inconceivable that they may pay the additional cost gas heating may impose on the mere basis of discharging their obligations to future generations; of " pay as you go."

A gas man of established position declared in this office—smiling as he did so, lest we consider him mad—that, getting down to fine points, the population of New York City would profit day by day if house heating by gas were general throughout the city.

He called to our attention not only the primary cost and transportation expenses of coal, but the wear and tear on pavements due to the passage of trucks, the cost of cleaning up sidewalks after deliveries and straightening up the piles in cellars; also the cost of opening drawbridges to pass barges, the time lost by street cars delayed by coal trucks on slippery hills in winter and the value of the time lost by thousands of passengers in those cars; all paid for indirectly, but paid for nevertheless.

His arguments were visionary, but only in so far that it would be practically impossible, under present-day conditions to impress their truth on a population of five million people. But they may be effective arguments at some future time. The idea of universal service is taking hold. We are beginning to think more of ourselves as a part of the community than as selfish entireties.

Rate Adjustments

The imperative need of relief from the present high prices of materials that is felt by many gas companies has been discussed several times during the past few months in these columns. A general discussion upon the subject cannot but result in finding a way out of the difficulties that at present beset the industry.

Attention is therefore called to the views of Charles M. Cohn, vice-president of the Consolidated Gas, Electric Light & Power Company of Baltimore, which are published on page 470 of this issue. Mr. Cohn puts into words several thoughts that many of us have vaguely cherished, yet have never expressed in the concise manner he brings them out.

The major thought reflected in his statement is that in the heat unit standard lies the possible solution; not merely the adoption of a standard of so many B.t.u.'s, but a standard set with regard to existing conditions.

Calling in the Country's Great Industrial Reserve

The labor situation in the gas industry is already acute. It bids fair to become doubly so. Even though the Nation in the selective draft deals leniently with us the opportunity to volunteer in established branches of the naval and military establishments will attract many from our ranks.

We now have a draft law, the doctrine that the most effective aid to the nation that can be rendered in many cases is simply by keeping to the job in hand has been widely preached.

But we must take Americanism as it is not as unquestioned authorities would like to have it. And the Americanism we know is in depreciation of these modern doctrines whose wisdom we admit in a general sense, but are unable to apply to ourselves. The average American's idea of real service to his country in war is to offer his body to the missiles of his country's foe, and, in so doing, deal as many blows in return as his opportunities permit. Hence we must expect many vacancies in the industry.

In the opinion of this journal the time has come, much earlier than was anticipated, when the American gas industry must look to the country's great industrial reserve—its women—to tide it over the emergency. Perhaps it will not be necessary to apply the substitution on the broad scale employed in England, but there are many tasks that can be discharged just as economically with women as with men, and without impairing their health in any degree. The gas company managements should give prompt consideration to this possible solution of one of our greatest difficulties.

Employees' Gardens as a Means of Offsetting Our High-Prices Difficulties

Viewed hitherto only as a measure of employees' welfare work, the advent of war and the consequent revelation of the Country's needs has given a great stimulus to the community garden idea among gas companies.

This was to be expected. The word and the spirit of service has become so much a part of the gas industry of to-day that it responds instantly to any call for service in any line within its scope. It knows that, along with its regular business of manufacturing and treating gas, it can and will be expected to contribute greatly to the conduct of the war. But it is not content to stop at this point.

It learns that the back yard vegetable garden has become a National asset. It does not stop to consider that gardening is not a specialized task; that it is a task within the capabilities of the lay public to accomplish. It does not stand hesitant in the confidence that even if it does no more than continue its efforts in manufacturing, selling and distributing gas it can be assured that it will be "doing its bit."

Instead it takes count of its idle lands and the fact that it is almost ideally situated to interest and encourage its employees in raising their own vegetables. In doing so it knows that, even though they raise only enough for their own uses, the country will be aided in that the efforts of others which must otherwise be spent in providing for them can be diverted to providing for the needs of our allies.

All gas companies should, wherever possible, get behind the home gardening idea. The fact that in so doing they would be helping the Nation is the prime reason. But there are more directly material reasons as well.

The advent of war is not going to have the effect of diminishing the cost of providing for a family. There will be taxes to be met. Unless the production of foodstuffs is practically doubled their selling price must be expected to go materially higher. The cost of materials has reached a hitherto unbelievable level. What we have learned of our allies needs indicates that we will be called upon to export vast quantities of coal.

The withdrawal of hundreds of thousands of men from civil life will place labor at a premium. Unless gas companies can find a means of lessening or keeping stationary the living expenses of their employees they will be compelled to pay much higher prices for their services.

Labor costs are high already. Surely, from present indications we cannot very well afford to pay even more for labor.

Encouraging employees to raise part of their own foodstuffs and finding them the land for the purpose will not solve our high-prices difficulties, but it will help.

	Construction	Exposure.	Cubical Contents	GAS CONSUMPTION, Nov.	Dec.	Jan.	Feb.	Mar.	Total.	Total Cost Gas,	Number and Size	Season's Cost 100 Cu.Ft.	Remarks.
1	Brick	N	2530	600	2200	6000	2800	4200	15800	$ 17 38	1-7s2c 1-9s2c	.70	1915-16
				1800	2800	4400	4600	3200	16800	16 80		.67	1916-17
2	"	E	2880	----	1600	4200	2200	3200	11200	12 32	1-7s2c 1-10s2c	.44	1915-16
				200	3600	4400	5200	3200	16600	16 60		.60	1916-17
3	"	SE	3360	----	100	1400	1000	1000	3500	3 85	1-6s2c 1-9s2c	.12	1915-16
				----	1000	2400	3200	1600	8200	8 20	1-10s2c	.25	1916-17
4	"	E	2880	----	600	1400	600	600	3200	3 52	2-7s2c	.12	1915-16
				----	200	----	600	600	1400	1 40		.05	1916-17
5	Frame	NWS	4032	200	3000	7000	3000	4600	17800	19 58	1-15s2c	.49	1915-16
				800	3600	4400	6200	5000	20000	20 00		.50	1916-17
6	Brick	N	8000	----	7400	12000	11000	7400	37800	41 28	3-10s2c	.51	1915-16
				800	3600	7000	8600	5200	25200	25 20		.31	1916-17
7	"	NES	80733	13000	53400	67800	64400	47400	246000	211 54	20 Rad 234 Sec	.26	1916-17
8	"	N	3080	----	1000	1800	2400	1400	6600	6 60	1-6s3c	.22	1916-17
9	"	NS	7920	----	3200	7400	10200	5200	26000	26 00	2-8s3c	.33	1916-17
10	"	NS	7912	----	----	7400	10200	5000	22600	22 58	1-8s3c 1-6s3c	.28	1916-17

Gas Rate 1915-16 First 10M $1.10, net; next 20M $1.00, net; 1916-17 First 10M $1.00, net; next 20M 90c,; next 20M 80c; all over 50M, 70c.

GAS STEAM INSTALLATION FOR OFFICES

a 5 per cent. reduction in price if installation is made on or before Sept. 15. While this plan has not yet been tried out, we feel confident it will work very satisfactorily.

Methods of Figuring Radiation

I believe the proper methods of figuring radiation can only be gained from actual experience. Radiation for heating homes in Savannah is arrived at as follows:

	Construction.	Exposure,	Cubical Contents.	GAS CONSUMPTION. Nov.	Dec.	Jan,	Feb.	Mar.	April	Total	Total Cost Gas.	Number and Size.	Season's Cost 100 Cub, Ft.	Remarks.
1	Brick	NS	16800	----	11800	19200	12400	18600	9200	71200	$76 12	3-15s2c	.45	1915-16
				2000	10800	18600	22600	17600	----	71600	68 64		.41	1916-17
2	"	EW	5600	----	3600	5200	4400	4000	----	17200	17 20	1-12s3c	.30	1916-17
3	"	NEW	10800	1000	9400	14400	16800	11400	----	53000	51 74	2-12s3c 1-8s3c	.48	1916-17
4	"	SW	10692	800	5200	7200	8400	4800	----	26400	26 40	1-12s3c	.25	1916-17
5	"	ES	8250	200	2400	3200	4200	2600	----	12600	12 60	1-8s3c	.15	1916-17
6	"	"	11648	200	1000	3800	4400	2400	----	11800	11 80	1-8s3c	.10	1916-17
7	"	NS	45900	200	5200	7600	11400	8800	----	33200	33 06	2-10s3c 1-12s3c	.07	1916-17
8	"	"	18900	200	3200	8400	5600	6000	3200	26600	29 26	2-15s2c 1-10s2c	.15	1915-16
				200	2800	7400	5800	4800	----	21000	21 00		.11	1916-17
9	"	"	25740	----	1000	3000	3400	4000	1400	13600	14 96	2-12s2c 1-10s2c	.06	1915-16
				----	2000	5200	5600	3600	----	16400	16 40		.06	1916-17
10	"	"	24000	600	6800	3400	17000	7600	3600	39000	42 20	1-12s2c 1-15s2c	.17	1915-16
				----	4600	7000	8800	8000	----	28400	28 40		.12	1916-17
11	"	SW	25920	2400	5000	13200	8000	6400	3200	38200	41 70	1-10s6c 1-10s2c	.16	1916-16
				400	5600	12400	2000	6000	--	26400	26 16	1-8s6c	.10	1916-17

GAS STEAM INSTALLATION FOR STORES

Determine the square feet of radiation by using the schedule as shown in the manufacturers' catalog, but include the ground floor as exposed wall if it is exposed to the outside temperatures.

After getting the total square feet of radiation which is based on raising the temperatures from zero to 70 degrees, determine the lowest temperature you have and figure to raise it from that point. In Savannah we figure on raising from 25 to 70 deg. or 45 deg. raise. By multiplying the total square feet, as figured above, by 9-14, we have the correct amount of radiation required. Of course, there are other points which will have to be considered, such as, exposures, construction, occupancy, etc.

Care of Radiators

Just before the heating season, we make an inspection of all radiators installed, filling them with water, adjusting gas burners and putting them in good working order. We had one case where a radiator was allowed to burn with no water in it.

The heated metal set fire to the wainscoting and came very near being serious. In two or three cases we found the walls scorched and on investigating, found the radiators were setting too close to the walls, and had no water.

This emphasized the importance of connecting radiators at a standard distance from the walls, also the importance of having the radiators supplied with water. We now connect all radiators four inches from the wall and are careful to inform our consumers that radiators should be periodically inspected every two weeks.

To illustrate the value of the sliding scale in charging for gas, I wish to mention an installation made in the Savannah Press News Building.

The central heating men were very active and did everything possible to get this business.

Our coal dealer, working in connection with the heating man, agreed to supply all the coal needed for five years and take his pay in advertising. The Press was already using over 50,000 cu. ft. per month and we talked 70-cent gas for heating. On this basis we landed the order for twenty radiators. The advertising value of this installation can hardly be overestimated.

General

Gas is very widely used in central heating plants, where natural gas can be supplied at a low cost per thousand. While this system has proven entirely satisfactory from a heating standpoint, I believe very little has been done on artificial gas, as the operating costs are very much greater than the use of other fuels. While there are other systems of gas heating, which are being used with satisfactory results, they have not been mentioned in this paper.

	Construction	Exposure	Cubical Contents	GAS CONSUMPTION, Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Total Gas Cost.	Number and Size.	Season's Cost 100 Cu. Ft.	Rdmarks	
1	Brick..	NESW	47120	800	3800	8000	2800	4000	4000	23400	25 74	6-15s2c	.05	1915-16	Church,
				2200	6800	7200	5800	----	----	22000	22 00		.05	1916-17	
2	Frame..	"	15000	----	2000	2200	4800	1600	1800	12400	15 50	1-15s2c 3-12s2c	.10	1915-16	Church,
				----	----	6800	3800	----	----	10600	10 60		.07	1916-17	
3	"	"	19548	400	6000	8600	10200	5200	----	30400	30 38	1-50s c 1Wall Ht	.15	1916-17	Club,
4	Brick ..	NSW	32400	----	----	20200	22200	14000	----	56400	53 76	6-12s3c	.16	1916-17	Factory.
5	"	..NESW	13480	200	6200	33400	32400	20200	----	92400	86 22	3-12s3c 1-8s3c	.64	1916-17	Police Headq'rs,
6	"	"	18558	800	5800	7200	7600	22600	----	44000	42 74	4-8s3c 1-10s3c	.23	1916-17	School,
7	Frame..	"	29740	12200	22800	1800	21600	----	----	58400	55 74	2-6s3c 3-10s3c 4-15s3c	.19	1916-17	School.
8	Brick ..	NS	55080	200	42600	27200	27000	----	----	97000	89 06	8-12s3c 1-4s3c	.16	1916-17	Theatre.

MISCELLANEOUS GAS STEAM INSTALLATIONS

The co-operation of the manufacturers is very essential to the future success of gas heating, but I believe that as the demand is created for gas burning appliances, the manufacturers will be only too willing to improve their appliances and apply new ideas in keeping with the demands created.

Scrubbing of Carburetted Water Gas Would Recover Great Quantities of Benzene, Toluene and Xylene

Gustav Egloff Points Out Vast Need of First Two Substances—Recracking of a Cracked Oil

In this world struggle upon which our country has launched itself two substances stand out in bold relief as fundamental in the successful prosecution of this war, declared Gustav Egloff in a paper presented before the American Chemical Society at Kansas City, Mo., April 10. These two substances are benzene and toluene. Benzene forms picric acid; and toluene forms trinitrotoluene, two of our most powerful explosives.

Our need for these two fundamental substances will soon become acute in this struggle and it is quite certain that the present number of by-product recovery plants, carburetted water gas plants, Pintsch gas machines or plants for the thermal decomposition of coal for illuminating gas, which in the main give us our present supply of benzene, toluene and xylene, will be inadequate to supply the tremendously increased need of these substances.

The carburetted water gas and Pintsch gas processes produce aromatic hydrocarbons as benzene, toluene and xylene by the thermal decomposition of petroleum distillates, but they are not operated as a rule for the light oil which contains the aromatic hydrocarbons, benzene, toluene and xylene, but for the gas which requires a certain illuminating value instead of a heat value, in all but about fourteen states.

Recracking of a Cracked Oil

In the industrial operation of carburetted water gas, Pintsch gas and cracking processes in general which form aromatic hydrocarbons, when the aromatics after the first cracking are separated, there is left a residue oil, disposition of which at a profitable figure is sometimes difficult. There is a conflict of opinion as to how many times an oil can be cracked profitably for the formation of gasoline, benzene, toluene and xylene.

There can be but one answer as to results of thermolizing a cracked oil. These can be deduced from the nature of the cracked oil itself and from data obtained in the cracking of different type oils. Depending upon the extent to which the decomposition produced by temperature and pressure has taken place, a recovered oil is obtained which contains aliphatic and aromatic hydrocarbons in proportions corresponding to these conditions.

If the reaction is carried far enough, it is possible to obtain a cracked oil which is composed almost entirely of aromatic hydrocarbons.

All petroleum crudes will not crack into commercial percentages of gasoline, or aromatics due to some petroleum crudes already being thermolized partially or wholly in the earth. In other words, a cracked oil is not as favorable an oil, for gasoline, benzene, toluene, xylene formation as an uncracked oil.

Tests on Water Gas Set

In an attempt to apply the data on the formation of aromatics gleaned from cracking in the gas phase in steel tubes, a number of tests were made upon a Lowe carburetted water gas set. The following results were obtained after a twenty-four hour run at four different temperatures at the base of the superheater. The gas oil used gave a specific gravity of 0.829/15.5 deg. C. and boiling point range of 93 per cent between 175 deg. C. and 345 deg. C.

Per Cent. of Benzene, Toluene, Xylene, Naphthalene and Anthracene on Basis of Oil Used for Production

Temperature, Deg. C.	600	675	750	800
Base of superheater				
Per cent. benzene	1.0	1.2	1.8	2.8
Per cent. toluene	2.1	2.6	2.7	2.7
Per cent. xylene	2.1	3.4	3.0	2.1
Per cent. naphthalene	0.0	0.0	1.9	2.0
Per cent. anthracene	0.0	trace	0.1	0.9

Cracking in a standard Lowe 6-ft. set gave results somewhat lower than thermolizing in a steel tube, but this is readily explained in part on the ground of difference in the starting gas oil, and the differences in apparatus and rate of oil flow. In the four tests, maximum conditions were certainly not obtained, but the

course of the reaction is exactly the same as when using a steel tube 8 in. diameter and 11.6 ft. in length.

Carrying the test further, the gas from the 800 deg. C. run was scrubbed by passing through an absorbent oil. The amount of gas passed through the scrubber was 1000 cu. ft. The absorbing oil was then steam distilled and the light oil recovered, was analyzed for its benzene, toluene and xylene content.

In round numbers the gallonage of benzene, toluene and xylene per 1000 cu. ft. gave:

0.07 gal. benzene per 1000 cu. ft. gas scrubbed	
0.06 gal. toluene per 1000 cu. ft. gas scrubbed	
0.01 gal. xylene per 1000 cu. ft. gas scrubbed	

These figures do not appear at first glance to have much economic value, yet they are interesting when one considers that according to Lesher's report published in the Geological Survey there were made in the United States 124,129,569,000 cu. ft. of carburetted water gas in 1915.

By making a national heat standard for gas, these fundamental substances could be recovered.

A few plants scrub the gas from carburetted water gas, but the bulk do not.

By putting in a simple scrubbing system and stills in carburetted water gas plants in this country the total gallonage of benzene, toluene and xylene which could be recovered per year on the basis of the 1915 report would be as follows:

Gallons benzene	8,689,000
Gallons toluene	7,448,000
Gallons xylene	1,241,300

in round numbers.

At present prices of benzene, toluene and xylene the economic value of the above gallonage would be:

Value of benzene based upon a present price of $0.55 per gallon, $4,779,000. Value of toluene price $1.75 per gallon, $13,034,000. Value of xylene at $0.60 per gallon, $744,600.

Immense Saving

In round numbers the saving in economic value at present prices of the three aromatic hydrocarbons from carburetted water gas scrubbed would be $19,000,000.

And we must recognize the fact that these figures are based upon the 1915 census. It is quite safe to say that this amount has increased about 20 per cent since that time, this being based upon an extrapolated value from previous years.

In this report only the benzene, toluene and xylene resulting from the thermal and pressure decomposition of petroleum oils has been given. This is a prolific and almost inexhaustible supply for the fundamental substances in explosives, and will fully yield all that this present war may demand. Coal, as all know, yields tremendous quantities, but there is a part of the light oil which is also a prolific source for the production of benzene, toluene and that is xylene. And it yields readily to benzene, and toluene formation by heat, and pressure treatment, as also with catalysers at low temperatures.

Coke Being Made from Illinois Coal

Beginning the first of the year, the By-Product Coke Corporation has been successfully using Illinois coal in the manufacture of coke. In the course of experiments which were started last year it was found that coke of approximately the Connellsville standard could be obtained by coking a mixture containing 40 per cent. of coal from Franklin County, Illinois, and 60 per cent. of Eastern Coal.

At its South Chicago plant the By-Product Coke Corporation produces about 4,000 tons of coke per day, using this mixture.

Illinois coal is likewise being used by the Illinois Steel Company at Gary and Joliet. The By-Product Coke Corporation has purchased two mines in Franklin County, and the United States Steel Corporation has bought one.

Great Financial Strength and Courage Required for Company Contemplating a Venture into Natural Gas Business

Great financial strength and courage are required of a company contemplating a venture into the natural gas business, declared A. G. Curtis, general manager of the Southwestern Gas & Electric Company of Shreveport, La., at the Southwestern Electrical and Gas Association Convention. Conditions differ materially from that of the manufactured gas industry, and a company mindful of the comfort and convenience of its patrons, and desiring to live up to its obligations, will have its ingenuity taxed to the utmost.

Peak loads for natural gas are approximately forty times the average demand, necessitating a supply and distributing system to have these capacities.

The weather is a very important factor in the natural gas business, and in our southern climate it is necessary to provide a supply and plant equipment which will probably only be used to its maximum capacity fifteen or twenty times in a season, during periods of extreme cold weather. In this climate, the industrial consumers close their plants with the advent of hot weather, and the only business left is that required in the kitchen and by the ice company. We all know there is very little artificial heat required here from the first of April to the first of November.

The business is a specialty. The problems of supply, transportation and distribution, to a company undertaking to furnish a community or communities, are intricate and constantly changing. The supply and the demand change. Each of these is a problem in itself; that of finding and maintaining an adequate supply is the greatest.

Drilling for gas has as many disappointments as that of oil, if not more, and is accompanied by great danger. A wild oil well is a terrifying thing, and a wild gas well, if anything, is more so. There are many conditions that will get the operator for gas into trouble; unfamiliarity with the structure in a new field, improper setting of casing, defective pipe or equipment, accidents, fire and cigarettes. Of course, every company drilling for gas hopes to be fortunate and get a good well. Wells with rock pressures ranging from 1,100 to 1,200 pounds have been found in the United States, and all of them, particularly these with excessively high pressures, require secure equipment and the best of care.

News of the Gas Industry

International Gas Company Changes Name

The International Gas Company, operating at Nogales, Ariz., has recently changed its name to the Arizona Gas & Electric Company which more properly covers the operations of the company, according to information received from Spiro S. Proto, president of the company. The first mortgage gold bonds have also been marketed recently in New York, amounting to a total of $200,000.

Fire Damages Gas Company Office at Quincy, Mass.

Loss estimated at more than $40,000 resulted May 3 from a fire in the one-story block of stores on Granite Street, in the heart of the business section of Quincy, Mass. The loss on the building itself, which is owned by Henry M. Faxon, will be about $15,000. The principal occupants who suffer losses are the Citizens' Gas Light Company, $10,000, and Joyce Brothers, clothing, $15,000.

In the gas company's cellar were thousands of gas mantles with coverings of paraffin paper and also 300 gas stoves carefully wrapped in paraffin paper. The smoke from the paraffin compelled the firemen to work in relays and several were overcome, but they returned to work as soon as they recovered. For more than two hours after the fire started the entire business section was shrouded in the thick pall of dense and sickening smoke.

Not until nearly midnight was the fire department satisfied that the fire was under control. By that time the floors of both the gas light office and the Joyce Brothers store had fallen and several firemen at work inside had narrow escapes.

Beverly Hills, Cal., Asks to Sell Plant

Petition of the Beverly Hills Utilities Company to sell its gas distributing system to the Southern California Gas Company for $18,500 was heard recently by Examiner Westover of the State Railroad Commission of California. The application will be presented to members of the railroad commission for a decision in the near future.

Ninth Annual Convention at Roanoke, Va. Among the Most Successful in Southern Gas Association's History

F. L. Marshall Elected President for Ensuing Year—Association Increases Its Territory—Pledges Support of Association to Administration

Wednesday and Friday meetings held at Hotel Roanoke, while Thursday's was held at the Natural Bridge Casino. Beautiful country and ideal weather add materially to success of convention. Eight papers presented—each of vital interest on timely problems.

Standing and singing "America" lustily, the Southern Gas Association started on the first day of its Ninth Annual Meeting. Mayor Broun welcomed the gas men to Roanoke and so did John Woods, secretary of the Roanoke Chamber of Commerce. R. J. Rolston responded in a neat speech.

Upon motion the roll call and minutes were eliminated. A motion to appoint a committee to draw up a suitable telegram to send to President Wilson, resulted in the following telegram being sent:

HON. WOODROW WILSON, President,
United States of America,
Washington, D. C.

The Southern Gas Association in Convention here assembled this second day of May has pledged its loyalty and support to the Adminisration in the present crisis and has declared itself in full accord with any and all policies that may be deemed necessary for the protection and welfare of our country and her citizens.

SOUTHERN GAS ASSOCIATION,
by E. D. Brewer, Treasurer.

The program was followed as closely as possible, and the reports from the executive committee, secretary and treasurer and of special committees were received favorably. A very good paper on "Advertising" was read by Thomas R. Elcock, Jr. of Philadelphia, Pa., which was followed by a paper on "Gas Heating" by H. D. O'Brien, Savannah, Ga., both of which caused much favorable comment. "Selling Campaigns" a paper by George Sligo, Atlanta, Ga. and "Gas for Industrial Purposes" by L. Gaston of Knoxville, Tenn. brought out many interesting

Bangor, Me., Company Files Petition for Rate Increase

It is going to cost the Bangor Gas Light Company $42,000 more for coal this year than in normal times, because of lack of water transportation facilities. Of this, about $10,000 can be made up in higher prices received for coke, leaving $32,000 to be met in other ways. The company is willing to shoulder half this burden of war expense, and to provide for the other half is asking the public utilities commission to approve of an advance of 25 cents per thousand feet in the selling price of gas. Recently the company issued a statement, which fully explained the situation but which in brief means that the cost of coal for the season of 1917 will average $6 more than for 1915, or, on 7,000 tons used per year, $42,000 increased cost and that the increase is only asked as a temporary relief.

New Haven Company Places Demonstration Light

One of the latest types of ornamental street lamps was placed recently on Crown Street by the New Haven Gas Light Company. This attractive unit is located opposite the entrance to the company's salesroom and faces almost the center of Orange Street. The light is of the boulevard type which has become popular for business and residential districts. Semi-diffusive glassware and a cluster of three Welsbach mantles gives a pleasant and brilliant appearance without glare. This type of lamp is being used in many cities and is the product of the Welsbach Street Lighting Company of America.

suggestions which will readily find application among gas companies.

The association increased its territory by taking in the territory of the artifical gas plants in West Virginia and Maryland.

Messrs. Louis Stotz of the National Commercial Gas Association and George G. Ramsdell of the American Gas Institute were present and were voted to honorary membership.

At 3 p. m. the automobile drive around the City and Hollins Loop and stopping at Hollins Inn for refreshments proved interesting to sight-seers. The Graduation Exercises of the Colored School opened the eyes of those who think or thought the negro incapable of being taught real domestic science. Every entertainment feature met with success and the weather was ideal..

On Thursday morning, May 3, the members started on an all day trip to Natural Bridge where the business session was held at the Casino. The visit to this point of interest was greatly enjoyed by all and great interest was shown by the many who addressed the chair on the papers read. In spite of the war the attendance was up to high water mark throughout the entire convention.

R. L. Ellis, Selma, Ala. gave a paper on the "Philosophy of Costs" at the Thursday morning session, and F. L. Marshall, who was later elected president, gave an interesting paper on "Distribution Service." The other two papers which were given at this session were "Modern Gas Lighting" by H. H. Dunn, Roanoke, Va. and "Accounting" by E. C. Stothart, Charleston, S. C., both of which were well received. The dinner at the Natural Bridge Hotel was followed by dancing in the Casino and later in the evening the return trip was made to Roanoke.

A business meeting was held in the Roanoke Hotel Ballroom Friday morning, at which some general business was conducted and officers for following year elected. The officers elected were:

F. L. Marshall, Augusta, Ga., president; M. M. Milton, Roanoke, Va., 1st vice-president; L. Gaston, Knoxville, Tenn., 2nd vice-president; and M. A. Bowlin, Jacksonville, Fla., secretary and treasurer. The following directors were elected: William F. Croston, Newport News, Va.; MacD. Dexter, Columbus, Ga.; E. S. Dickey, Baltimore, Md.; and George Sligo, Atlanta, Ga.

The association will meet in Chattanooga, Tenn., May, 1908.

A luncheon was served at Rockledge Inn, Mill Mountain, by the Rotary Club and during the afternoon a card party was held at the Roanoke Country Club for the ladies. A grand ball wound up the convention in the evening at the Hotel Roanoke.

New Pilot Lighter Placed on Market—Not Affected by Winds or Drafts—Cuts Pilot Costs

A long needed improvement in mantle lighting has recently been perfected by the Welsbach Company of Gloucester, N. J. The new invention has been named the Welsbach "C-C" Pilot Lighter and it is claimed by the company that "It defies the drafts."

Fumbling for a switch has long been considered better than striking a match, but lights equipped with this new pilot eliminate even the fumbling.

The "C-C" Pilot consists of a small roll or bundle of fabric similar to that of a mantle, fitted on the tip of the by-pass tube. When ignited it burns out like the "C.E-Z" mantle, and thereafter glows with a white light. A draft does not affect it.

The "C-C" Pilot takes advantage of the catalytic action of mantle ash. The construction of the pilot tip tends to keep some part of the tip ignited by breaking up or baffling the draft assailing it. This maintains the heat to a point where the gas will again ignite over the entire pilot tip when the air pressure subsides.

The "C-C" Pilot is so simple, so obvious, one is rather astonished when he first regards it.

When a feature like the "C-C" Pilot drops right into the lap of the gas industry, some very vigorous co-operation should be put in action, so that everyone, consumer included, may share its benefits.

Output Record Increases

The output of the Old Colony Gas Company for April was 7,273,000 cubic feet, compared with 5,486,000 cubic feet the same month the previous year, an increase of over 32 per cent.

Sliding Scale Suspended by Massachusetts Company

The Springfield Gas Light Company, owing to increased cost of coal, supplies and labor, has been forced to suspend temporarily its sliding scale whereby large industrial concerns have enjoyed a discount proportionate to the amount of gas used. Beginning June 1 and continuing until conditions change, all users will pay the flat rate of 85 cents per 1,000 cu. ft.

The prevailing rate is and has been 85 cents per 1,000 feet for the first 50,000 feet, 75 cents per 1,000 for the next 100,000, and 65 cents per 1,000 for all in excess of 150,000 feet. The company, as explained recently by Manager W. H. Bradley, is faced by tremendous increases in cost of production. Between 125 and 175 tons of coal are consumed per day. The increased cost of this item is easy to compute. A total of 175,000 gallons of oil is used monthly. This has increased about 60 per cent. in cost. The expense of other supplies has risen all the way from 30 to 200 per cent. Labor is more costly and piping for main extensions is up in some cases 250 per cent.

The company is prevented by law from directly adding this increased cost to the price of its product and the only method of cutting corners that appears is to do away with the discount for quantity. This plan, therefore, has been adopted with the assurance that when conditions allow the discounts will be resumed.

Grand Rapids Company Gives 9 Acres for Garden

The Grand Rapids Gas Company has had ploughed and harrowed nine acres of its vacant ground which it has turned over to its employees to be made into gardens.

The garden men who went over the plot state that the soil is exceptionally good and will produce a very satisfactory yield.

Many other landowners are also co-operating to put the Grand Rapids gardens among the leaders in the production movement.

Ukiah (Cal.) Company Asks Increase

The Ukiah Gas Company has asked the California Commission for authority to increase its monthly minimum charge for gas in Ukiah, Cal., from 50 cents to $1.

Utah] Commission Creates Seal

The Public Utilities Commission of Utah is required under the law which creates it to have a seal, which it shall attach to its orders, and which shall be recognized by the courts as official. For this purpose a design has been adopted by the commission, which was submitted by Hugo C. Lewis, office engineer, for the State Road Commission.

SEAL CHOSEN BY UTAH COMMISSION

The seal is circular, as shown above, with the words " Public Utilities Commission of Utah, 1917," running around the edge of the circle. Inside this is a semi-conventional drawing showing a double track railroad, a gas plant, telephone and telegraph wires, factories and other industries that come under the regulatory control of the Public Utilities Commission.

Rates Go Up in Akron, Ohio

The East Ohio Gas Company has announced an advance in gas rates to 37 cents a thousand feet from 35 cents a thousand for Akron, Barberton and near communities.

The higher prices of labor and of materials necessary in the maintenance of their lines is given as the reason for the increase.

The company is operating in Akron under a 10-year franchise, which gave them the privilege of raising their rates from 35 cents to 37 cents a thousand at the end of five years from the opening date.

The five years expired two years ago, but it was not necessary to raise at that time and they did not do so. Conditions are different now, they say, and the raise was forced.

The usual two-cent rebate will be allowed on bills paid before the 10th of the month.

Two Sessions at Southwestern Convention Devoted Exclusively to Gas Matters

K. L. Simons Elected Chairman of Gas Section—Interesting Discussion on Gas Heating—Possibility of Making Excellent Gas from Texas Coals —Associations Indorse Selective Conscription

This year more attention was given at the convention of the Southwestern Electrical and Gas Association, held at the Adolphus Hotel, Dallas, to subjects of special interest to the members of the Association interested in gas companies than has been the case for some years. Two entire sessions were devoted exclusively to the presentation of papers and discussion of subjects of particular interest to gas men. To F. D. Murphy, general manager of the Houston Gas & Fuel Company, Houston, is due the credit of bringing about a most successful convention from the gas man's standpoint.

Gas Supply of Carthage, Ind., Company Run Out

The natural gas supply of the Farmers Natural Gas Company of Carthage, Ind., has practically run out and the company has discontinued business. What little gas that remains in the well is left to run to waste. This journal is indebted to L. C. Frost, formerly manager of the company for the foregoing information.

Utility Assessments on the Rise

Finishing the drastic increases in tentative assessments of corporation property for taxation purposes, the state board of equalization recently disposed of some fifty public utility companies by tentatively increasing the assessments from 10 to 500 per cent. The companies will be heard May 18.

The Oklahoma Gas & Electric Company, which supplies a number of towns in the state, was given the most radical increase. From the assessed valuation in 1916 of $2,500,000, it was jumped to $6,129,679.45.

The statement of the Oklahoma Gas & Electric Company on which the increase was based was as follows: Capital, $2,600,000; funded debt, $2,863,000; net income last year, $485,370.18; expense for fixed properties, $6,129,679; surplus, $65,486.

Other companies which were raised materially were: Muskogee Gas & Electric Company, $1,000,000 to $3,559,941; Tulsa Public Service Company, $700,000 to $2,665,491; Shawnee Gas & Electric Company, $290,000 to $1,878,723.

A special effort was made this year to arrange a satisfactory program for all concerned and that desirable end seems to have been accomplished. Sectional chairmen were appointed during the year and given entire charge of arranging a program of peculiar interest to the respective utility operators and this was done successfully as a splendid attendance at all the meetings reflected. A very full and active discussion of the subjects was had.

John R. Babcock, Assistant to the President of the Chamber of Commerce and Manufacturers' Association in Dallas, in extending a welcome to the Association illustrated how utterly dependent the public were on the utilities represented in the Southwestern Association. He said if all these services were turned off for an hour some day the public would readily realize the great convenience and modern necessity these utilities serve.

Gas Session

F. D. Murphy opened the gas section with a whimsical address which was in effect a denial that he was to make an address.

G. S. Barrows of the General Fire Extinguisher Company, was the first speaker. His theme was mainly the work the National Gas Associations are doing in the heating field. Many interesting points were brought out in the discussion following his paper. For example:

In reply to an inquiry as to gas-steam radiators for general residence heating he answered:

Gas Steam Radiators

" With the company that I was formerly connected, which operated in a very large number of cities in proval of all appliances, and after very thorough discussion with our

engineers and the commercial men, and by talking the matter over with the representatives of other gas companies aside from ours, they decided that they would only permit the installation of blue-flame burners, which included gas steam radiators, in rooms where the occupants were actively employed, offices or kitchens, stores, particularly stores where the doors were opened frequently, drug stores and cigar stores, but that they would not permit the installation of those appliances in living-rooms and bed-rooms, or where people might go to sleep.

"The reason they took that action was not because they were afraid that if the appliances were properly adjusted and burning properly there would be any objection to them, but that if they should happen to flash back carbon monoxide would be formed and it would be formed in sufficient quantities to have very serious results.

"Since that time I believe that policy has been modified, and now they recommend that these appliances be not installed in bed-rooms, but I think they permit the installation of them in living-rooms. I am not sure that they do in bed-rooms.

"Personally, I believe that any blue-flame appliance where it may flash back is a very unwise thing to put into a bed-room or into a small room like a bath-room. That is more true in the North than it is here in the South where you have more ventilation and the rooms are not made as tight as ours. You have higher ceilings here, and I am not so sure but what gas steam radiators are not all right for these rooms down here. Up there I would not want to see them go in.

"I am interested in a heating appliance, but I advised a man in a city where I was very anxious to get one of my particular pets installed, to put in gas steam radiators, because he could do it at somewhat less expense than to put in what I had."

He replied to a question as to whether it was reasonable to expect that with 50-cent gas the companies could heat a man's dwelling with hot air or a steam system as cheaply as it could be done with coal at $6 or $8 per ton, and ranging from 9,000 to 11,000 B.t.u.'s as follows:

Competing with Coal

"I should say that with coal of that grade and with that price for gas at 50 cents a thousand, that you ought to operate 20 per cent. to 25 per cent. below the cost of the coal. In Kansas City we were selling gas at 25 cents. We were competing with coal at $4 a ton. The better grade of coal, Arkansas Anthracite, sold at about $7 a ton, but with $4 or $4.50 coal and with gas at 25 cents a thousand, we were doing a little bit better than breaking even.

"Now it is a little peculiar that people seem to have so much money to spend for heating, and if you gave them gas at 10 cents a thousand the heating bills would be pretty nearly as big as they would be if the gas was 50 cents a thousand.

"It simply means they will waste it, they won't be as careful with it when it is 10 cents a thousand.

"They know their gas bill won't be large and they won't turn it off. If the gas is 25 cents or 50 cents, the same gas, your gas bills won't be higher. That has been proven, I think, by experience.

"I am absolutely certain that with gas at 50 cents a thousand and coal at $7 or $8 a ton, if you will run those appliances yourself that you can guarantee a 25 per cent. saving. If you turn them over to the consumer to run I would tell the consumer you can do a little better than break even. Then when he does do better than break even he won't come back at you. I think you could guarantee 25 per cent.

Asked if as against $12 coal he could burn $1.50 gas, he replied:

"With hard coal at $12 a ton I presume they could burn gas at about 80 cents. In Providence there is an interesting hot water installation. A man built for himself a fine house, one of the best houses in Providence. He wanted it heated with gas. His basement was all given over to billiard rooms and various other rooms for entertainment and he had no place for a furnace in his house, and he was going to put in radiators, and I advised against it.

"He would not have anything else put in, so we put in gas at 85 cents a thousand and hard coal was selling then for about $8.50 a ton. It has cost him so far this season about 70 per cent. more for gas than it would for coal. At the end of the season I think that is going to come down to about 50 per cent. My estimate was that the gas would cost him three times as much.

"He was willing to do it for the convenience and cleanliness of it."

Following the discussion on Mr. Barrow's address, the paper by K. L. Morris, general manager of the El Paso Gas Company, was read.

Preceding the discussion the following resolution was presented and approved.

Indorsement of Selective Conscription

"The members of the Southwestern Electrical and Gas Association representing the large majority of the street and interurban electric railways, gas companies, electric light and power companies and waterworks companies of the Southwest, in full convention assembled, have unanimously pledged their support to the National Administration in all its war measures, and especially the selective conscription, and tender their services and the use of their property to the end of the defense of the country."

Then followed the discussion of Mr. Morris' paper, after which L. K. Whitehead, superintendent of the gas department of the Southwestern Gas & Electric Company of Texarkana, presented a paper on gas distribution. Following the discussion on this paper that of F. L. Weisser, superintendent of the gas department of the San Antonio Gas & Electric Company, on the determination of the heat efficiency of gas oil was presented. This was followed by the paper on natural gas by A. G. Curtis, general manager of the Southwestern Gas & Electric Company of Shreveport, La., which terminated the first session.

Second Session

The second session was largely taken up by an address by Prof. E. D. Schoch, of Texas State University. Various interesting possibilities suggested in this paper follow:

Those of us who are in natural gas work are in a business which may at any time terminate more or less abruptly, and you are jeopardizing your equipment, your piping and all that if you can't change to an artificial gas system which will really be able to compete with natural gas.

The present-day method of making artificial gas at least apparently, we will say, is not able to compete in point of price with natural gas, be the real cause as it may.

That brings up the question, will we be able to do something for making artificial gas in this state without sending to Alabama for coal or coke, and without using fuel oil, however valuable that may prove to be?

Just at present we have a store

(Continued on page 16 of Advertising Section)

Chattanooga Company Tells Public of Material Costs and Asks for Increase in Rates

The Chattanooga Gas Company, operating in Chattanooga, Tenn., has used one of the most effective means of gaining an increase in rates to meet the abnormal cost of gas production, and at the same time hold the good-will of its consumers.

They prepared the advertisement shown below, which brings out clearly the condition which is now prevalent throughout the entire industry, and inserted it in the Hamilton County *Herald*, occupying a full page spread. A large portion of the reading columns were also devoted to a further explanation and the assurance that the increase in rates was only taken as a temporary means of relief.

The increase asked for by the company amounts to 25 cents per thousand cubic feet, which is figured to bring the revenue up to a point that will at least balance the profit and loss columns.

To cite from their newspaper account, "the loss per annum at this time is between $55,000 and $65,000," while the gas company's books show an increased cost in four of the main items which enter into the business as follows:

Coal, per annum.....	$55,000
Oil, per annum.....	6,000
Labor, per annum....	3,000
Supplies, per annum...	10,000

The idea of using this large newspaper space and of so clearly putting the matter before the public is certainly a straightforward and aboveboard method of procedure.

The Necessity For a Temporary Change In Rates

The conditions now confronting Manufacturers, Merchants and in fact our entire population have had the same effect on the GAS COMPANY as they have had on all others—it has changed the price.

Prices on materials have increased during the past year at a rapid rate as we all know, but for the past few months the rate of increase has been even greater than ever before.

Contracting for year's supplies has in almost all cases been abandoned and today we pay today's prices; tomorrow, tomorrow's prices and so on it goes.

In our business coal is our principal requirement and it takes about 18,000 tons every year to do us. In normal times, even up to last year, we paid $2.05 per ton on cars at our plant. We were able to get some of this coal last winter when the people were protesting against $7.00 coal and we appreciate how they felt for we had to buy a lot of high-priced coal ourselves.

The present price on this coal is over $5.00 and how long this price will hold we are unable to say—very likely it will go higher; at any rate, this increase increases our cost on this one item alone over $55,000.00, and it is going to keep us busy to get coal at all as only a very few coals can be used for GAS making. Oil to make GAS is even higher and therefore offers no help. On a very small order—one-fourth of our contract just expiring we paid an advance of $6,000.00.

Labor has been and is now confronted with the increasing High-Cost of Living and we have contributed an increase to help our employes and we only wish we could do more—they all need it now.

Now to meet these war conditions it is necessary to increase our price 25 cents per thousand cubic feet—not as a permanent thing but only so long as this condition shall remain—then we go back to our old low price. This increase does not mean very much to the average consumer; perhaps 50c to 75c a month and to the Manufacturer it does not unnecessarily burden him—to us it means the avoidance of Bankruptcy and the continuation of our business.

These Are the Facts and the Time Has Come to Tell Them to You.

CHATTANOOGA GAS CO.

J. P. HOSKINS, President .·. S. E. DeFRESE, General Manager

DIRECTORS

W. A. Sadd G. E. McGee Garnet Andrews Wm. J. Nixon

CHATTANOOGA ADVERTISEMENT ON RATE INCREASE

Manufacturer Tells Association Members of Exhibition to be Held at Convention

The matter of informing association members of special exhibits to be given at conventions is a real form of co-operation, especially when the exhibits hold forth something of special importance to the gas man.

The Chaplin-Fulton Manufacturing Company has sent a letter recently to all members of the Natural Gas Association of America, telling them of the exhibit which they are to give at the Twelfth Annual Convention, to be held in Buffalo, May 14-17, 1917.

As their letter to the members states, "This exhibit is what might be called a school of instruction." At Booths 83 and 91 the company will have a practical man give demonstrations and furnish information that may be desired, as to how to dismantle properly, repair and reassemble the various parts of regulators and gas governors.

The letter points out to the company manager the mutual advantage of such an exhibit, and stimulates convention attendance.

Consumption Increased from 350,000 Cu. Ft. to 3,000,000 Cu. Ft. by Sales Efforts

A contract has recently been closed with a large plant in the vicinity of Newark by George H. Davis of the Newark Industrial Fuel Department for a 15 hp. automatic gas fired steam boiler, according to a report given in the April *Service*. As far back as 1907 Mr. Davis first sold this plant some small soldering iron heaters. In subsequent years he added melting furnaces, hardening furnaces, a large tinning equipment and a number of heavy duty soldering iron heaters. In consequence the consumption has increased from 350,000 cu. ft. in 1907 to 3,000,000 cu. ft. for 1916. The sale of this boiler furnishes a splendid example of the results of persistent efforts to gain gradually the entire heating load of any plant.

Ohio Cities Buy War Bonds

In line with the patriotic attitude of many corporations, the Ohio Cities Gas Company will purchase $100,000 worth of the proposed United States war bonds.

Societies and Associations

THE NEW YORK SECTION OF THE GAS MEETERS will hold a special meeting on Wednesday, May 16, at Stewart's Rathskeller, 30 Park Place, New York City. Dinner will be served at 6 o'clock, and the meeting will be opened at 8 P. M. promptly. The purpose of this meeting is to consider and advise with the commissioners as to the best means of solidifying the organization and laying plans for doing away with the present lack of interest.

Personal Notes

THE BOISE (IDAHO) GAS LIGHT & COKE COMPANY at their annual stockholders' meeting elected the following directors: Charles Theis, Spokane; Joseph H. Brewer, Grand Rapids; William Stoehr and R. H. Johnson, Boise. Mr. Theis was named president, Mr. Brewer vice-president and Mr. Stoehr secretary and treasurer.

J. R. WOHRLEY leaves the Lincoln Gas & Electric Light Company to assume the duties of assistant gas efficiency engineer under H. D. Hancock.

O. H. SINCLAIR, for the past three years foreman of main and service work of the Kennebec Gas & Fuel Company, Waterville, Me., has resigned to accept a position with the Waterbury (Conn.) Gas Light Company.

D. J. BUCKLEY, who for the past 25 years has been employed by the Brockton (Mass.) Gas Light Company, will take charge of a new branch of accounting known as the credit department, which will include general supervision of the company's interests in all new and old accounts. There are over 20,000 consumers now on the books. Mr. Buckley has seen the business grow from $25,000 a year to nearly half a million, and the accounting department increase from two or three members to 25. He is now one of the company's oldest employees.

WILLIAM H. BURROWS of Middletown, died recently. He was president of the Middletown (Conn.) Gas Light Company and a number of other well known local concerns.

C. E. GRAY has recently resigned his position as general manager of the Boise (Idaho) Gas Light & Coke Company and accepted a position as manager of the Utah Gas & Coke Company, of Salt Lake City, former owner of the Boise Gas Light & Coke Company.

A. A. WILBUR, for the past sixteen years connected with Stone & Webster of Columbus, Ga., as assistant treasurer of the Columbus Power Company, Columbus Railroad Company and Gas Light Company of Columbus, has recently severed his connections to accept a position as assistant treasurer with the Brockton (Mass.) Gas Light Company. While with Stone & Webster he acquired valuable training in financial affairs, which has well fitted him to take charge of the rapidly growing accounting department of the Brockton company.

THE PUBLIC SERVICE COMMISSION OF INDIANA at a recent meeting appointed the following members: Ernest I. Lewis, William J. Wood and John W. McCardle.

CHARLES G. COOK, assistant division agent of the Southern Division of the Public Service Gas Company, died suddenly on April 15, 1917. Mr. Cook had been connected with the commercial side of "Public Service" and its predecessors since 1899, and before becoming assistant division agent was for many years agent in charge of the Trenton office.

Construction Notes

New Holder Under Construction at Malone, N. Y.

The rapid increase in the gas output of the Malone Light & Power Company has made it necessary to construct a new 50,000 cu. ft. gas holder, the foundation of which is now under construction.

The contract was let to the Stacey Manufacturing Company, Cincinnati, Ohio, last Fall, and calls for a completion of the holder by Sept. 1. It is the expectation of the company, according to S. G. Hunter, superintendent, to add another 50,000 cu. ft. section to this holder within a year or two.

Sheboygan Company May Extend Service

At the urgent request of Mayor Boldt of Sheboygan Falls, Wis., and a number of citizens and institutions of Sheboygan Falls, the Sheboygan Gas Light Company is investigating the advisability of extending its mains to the neighboring city.

Sheboygan Falls has never enjoyed gas service but the members of the city council believe that if gas can be furnished at a reasonable price that many people will be glad of the opportunity to secure it.

If the extension is made to Sheboygan Falls the main would doubtless go through Kohler also so that the residents of that village could secure the service.

The matter is being thoroughly considered by the Sheboygan Gas Light Company at the present time. A survey is being made from which maps will be prepared and an estimate of the cost procured. It is likely if it were not for the exceedingly high price of the piping and the great difficulty in securing gas pipe at this time that the extension would be made by the company immediately with little hesitancy.

Mt. Clemens Improvements Near Completion

The new coal gas benches for the Mt. Clemens Gas Company, Mt. Clemens, Mich., consisting of eighteen retorts will be ready for operation within the next thirty days.

The work, promised for completion March 1 has been seriously delayed by the non-arrival of fire brick and iron work, one car of iron work shipped from Cleveland on March 26, having arrived just recently.

With this improvement completed the gas company will have entirely rebuilt their plant within two years. The good work is not to stop, for a duplicate of the new installation is to be installed in place of the old benches that are rapidly disintegrating and with which sufficient gas is only being made with the greatest difficulty.

Main Extension in Waterbury, Conn.

The Waterbury (Conn.) Gas Light Company has been granted permission to open streets and replace the present mains with six-inch pipes on South Main Street from Union Street to Exchange Place; South Main Street from Meadow Street west to Dover Street; Scovill Street from Spring Street to South Elm Street and Grand Street from Canal Street to Bank Street and on South Elm Street from Union Street to Pond Street.